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AND

Diseases of Women and Children

EDITED BY

BROOKS H. WELLS, M. D.

Professor of Gynecology at the New York Polyclinic and Gynecological Surgeon to the New York Polyclinic Hospital; Consulting Gynecologist to Beth Israel Hospital, New York; Consulting Abdominal Surgeon to the Brattleboro Memorial Hospital, Brattleboro, Vermont; Associate Surgeon to the Woman's Hospital of the State of New York; Fellow of the American Gynecological Society, the New York Academy of Medicine, the New York Obstetrical Society; Member American Medical Association.

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LIST OF CONTRIBUTORS.

ADAMS, SAMUEL S., Washington, D. C.
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NO. 1

ORIGINAL COMMUNICATIONS.

THE GENERAL ADMINISTRATION OF ANESTHETICS.*

BY

J. M. BALDY, M. D.,
Philadelphia, Pa.

FELLOWS OF THE AMERICAN GYNECOLOGICAL SOCIETY:

It is with profound regret that I have officially to announce to you the death during the past year of two of our honorary fellows, Dr. Robert Barnes, of London, England, and Dr. William T. Howard, of Baltimore, Maryland; the former one of the earliest guests of this society after its organization, the latter a founder-member and an ever-active participant in your meetings. In the death of William T. Howard we have lost one of the landmarks of our society, one of the links of the past—a loss by which we are all equally grieved.

In this connection it were well to remind you that in the process of evolution we are rapidly having our ranks depleted by the death of our oldest and most tried members. But few of our founder-members remain with us, and these few are rapidly advancing in years. No organization can long stand such a drain and remain pre-eminent in its chosen field without replenishing its ranks with the best of the younger generation. It would seem that a systematic policy might with advantage be adopted by you, one which will keep your ranks from being completely filled so as to always have a place for *the* man when he appears, one which will studiously consider primarily an appli-

*The President's Address. Read before the American Gynecological Society at its thirty-third annual meeting at Philadelphia, May 26, 27, 28, 1908.

cant's scientific attainments and fully establish these before allowing his qualities of good fellowship to warp your judgment. And as a secondary matter might it not be well to avoid a too great concentration of strength in any one locality? It would appear that your membership on the Atlantic seaboard is too largely predominant and that other sections of this great country should be more fully represented.

In presenting this your presidential address, it would seem proper to discuss with you general policies, advances and failures of the past and the duties of the future rather than to devote the time to a scientific paper. The objects of societies in general, of this society in particular, are of a mixed character, scientific and social. The social side brings men together, gives opportunity for personal contact and estimate of personal worth, and no better way exists of discovering an individual's professional capacity than to become acquainted with his methods of thought, accuracy of observation and process of reasoning as applied to those every-day affairs with which everyone, scientist or layman, is equally well acquainted and of which he is equally competent to judge. In this way, in a large measure, are we able to form a fairly correct idea of one's professional ability, especially where the knowledge thus acquired is added to the analysis of his scientific papers and discussions. In this way are we measurably able to estimate the worth of his writings and his professional opinion. A man's enthusiasm, his seriousness, his belief in himself and his logical defence of his position, although perhaps differing from one's own, cannot fail to impress the observer as to his ability and his honesty: the true worth of a man is rarely underestimated by his immediate associates and peers; here he soon finds his proper level. The social side of an association's meetings has, therefore, more of value than at a superficial glance would appear, and it would seem that rather than to depart one iota from the high standard of the past as set by our society, we should view with pride the efforts expended in this direction and should continue in the future to develop this side of our meetings even more, if that were possible, than in the past.

The scientific side of our meetings has from the organization of the society been of a very high standard and the transactions of this body contain about all that is known or worth knowing in the gynecologic and obstetric arts. It has been, from time to time, the effort of various organizations similar to our own

so to conduct their meetings as to bring out the best results, both as to papers and discussions. With this thought in mind, in 1904, your president, Dr. Reynolds, in his presidential address, suggested the establishment of fixed discussions with a series of papers limited as to time, followed by discussions of a similar character. In consequence of this suggestion you have had a programme which has occupied the mornings of the first two days with a symposium of subjects previously selected by your council. This departure from the past has had its advantages, but has also had its disadvantages. It has a tendency to develop short abstract papers as against fuller and more scientific ones. It occupies the two most important sessions of your meetings; on the second day it interferes with your presidential address (which is fixed at a stated time) and your president's address interferes most materially with the symposium. No paper or series of papers receives the same thoughtful and thorough consideration in a discussion which is interrupted by a subject foreign to its import as does one which is continuous. The symposium feature is a valuable one and should be continued, but were it not well at this time to recast the lines and modify it to the extent of one symposium day (or if two be still considered desirable) to confine the days to the first and last of the meeting? If this were done, a session, which is generally a broken one and one of more or less failure on account of the departure of members for home on the last day, might be rendered equally as important as the others and would have the additional advantage of leaving your second day open exclusively to well-developed scientific papers and with no interference with your presidential address. These thoughts are offered for your consideration and matured judgment and for the action of your council.

In looking over the field of our endeavors for the past year I find nothing new advanced nor any startling improvements on the old. After a decade of obstetric and gynecologic activity unprecedented in any branch of medicine, we seem like wise men to be resting, retrospectively, and putting our house in perfect order before proceeding further. Notwithstanding this, the signs for the future are bright, and when we note on the one hand the activity of the obstetric world in that great undertaking, the prevention of blindness at the beginning of life, and the activity of the gynecologic world in the fight against that greatest of all scourges of middle life, cancer, we may look with

complacency upon the criticism which has predicted the end of our branch of medicine as a specialty. In fact, after having developed the basic principles of everything known in abdominal surgery and having made it possible by our pioneer work for the general surgeon to develop what little good he is responsible for in visceral surgery, we may even yet develop a field common to us both, the vast importance of which has been only too long neglected by all—anesthesia.

The general administration of anesthetics as performed today is the shame of modern surgery, is a disgrace to a learned profession, and if the full, unvarnished truth concerning it were known to the laity at large it would be but a short while before it were interfered with by legislative means—and properly so. In the traditions of our profession the poor receive as good service as the rich, so in the matter of anesthetics is this true only with this difference: in the first instance they both receive the best that is in us, in the latter they both receive the worst. Who of you is not familiar with the patient coming for a possible operation whose one dread is the approaching anesthetic—a dread born of a past personal experience or the experience of a friend? Who of you is not familiar with the terrible struggle for breath so common to the etherizing-room of the past, the congested blackened face, the prolonged anesthesia, the patient only partly relaxed, the delay in the operation, the difficulties of the manipulation after an operation begun, the heartsickness at a difficult and delicate operation made doubly and trebly so from the unnecessary chances of sepsis, hemorrhage and shock, the feeling of a patient lost from no lack of skill of your own, the slipping of a ligature and a secondary operation or death, the immediate death on the table from failure of the heart, drowning due to inspired sputum, the vomiting on the operating table to the detriment of the operation, the prolonged after-period of nausea and vomiting to the great suffering and misery of the patient, the inspiration pneumonias and other pulmonary complications, the nephritis and urinary suppressions all due in great part to faulty anesthesia? How many deaths at the time of the operation, shortly after operation, or some days or weeks later are due to the same cause? What relation does the anesthetic bear to the large group of pulmonary complications reported from so many different sources, and what is its relation to the thromboses and embolisms which have in the past caused so much suffering and disaster? What of the

fatty degenerations of the liver, heart and kidneys? Who can tell? This fact is certain, however; more deaths following operations are due directly and indirectly to the administration of the anesthetic than the profession in the past has dreamed of. Wherein lies the fault and where is the remedy? The present long-established and time-honored custom of having the anesthetic administered in hospitals by the resident physicians, in private homes by any available doctor in the neighborhood is to be condemned. The man who is able and ready to pay any amount of money for the services of the most skillful surgeon available has his life and those of his family unknowingly put at the mercy of a boy just from his books, with absolutely no practical knowledge of anesthetics and with less teaching. One has only to recall his own experience and feelings during the first few weeks of his apprenticeship at anesthesia to realize how thoroughly at the mercy of chance was the survival of the patient and how utterly helpless he would have been had anything gone wrong. Is it an exaggeration, then, to call such a condition a disgrace to the profession of medicine?

Who is to blame for this state of affairs? The young men to whom the anesthetic is relegated? By no means. As a rule they are a hard-working, well-meaning and enthusiastic body of men eager for knowledge and faithful to every trust. The anesthetic is placed in their hand and they do the best they know how and are in no way to be blamed if although ignorant and inexperienced they are placed in a position of trust in the operating-room second in importance only to that of the surgeon. Are hospital managers at fault? It would seem not. They accept the customs of the past as they find them, and if the medical men on whom they depend for instruction in medical matters are so derelict in their observation, knowledge and duty as to remain content, who can find fault with the hospital management? Who, then, is at fault in this most grave matter? We ourselves, gentlemen, and we alone, members of the medical profession. We have remained too long bound by the traditions of the dark ages of surgery; we have so devoted our attention to the discovery of new operations and to the development of their technic that we have too long forgotten one of the most vital points in our operating-rooms. Unless we arise shortly to the importance of this reform ourselves, an awakened public opinion will take charge of the matter and legislate us into a safer position. Fortunately, the reform is in sight. Occa-

sionally we hear an isolated voice raised against the continuation of this state of affairs, a protest which is lost in the general activities of professional life. In a few bright spots we see an effort made to reform with an isolated hospital here or there employing a salaried anesthetizer. And herein lies the remedy—a salaried anesthetizer in each and every hospital in the land with a salary of sufficient size to attract to the service men of proper intelligence.

Dollars and cents will be an important item in the success of this movement, and a sufficient sum to entice a young man of brains for any great number of years away from a full professional life with all its rewards will be found difficult to raise. Fortunately, however, woman offers a solution to the problem. The qualities of a woman are just those requisite to quiet and soothe a frightened or timid patient approaching the anesthetic, and she is the better qualified to devote her whole attention to her work from the fact of her having no ambition to do surgery and, therefore, having less incentive to neglect her anesthetic in order to watch the manipulation of the surgeon. In addition, is not her very timidity an advantage in that it makes her realize more fully her responsibilities and keeps her more attentive? And, finally, an amount of salary which will prove attractive and permanently remunerative to her would be no temptation to a physician who had the fuller field of professional remuneration ahead of him should he prove a success. Women have been tried in this capacity with the greatest success and the matter is beyond the experimental stage. Many brainy women fully capable of being trained to this responsible position have entered the nursing profession, and it is from this source we may look for a solution of our difficulties. Women are being tried and are proving most satisfactory as anesthetists, and it will be a bright day of advance in the technic of the operating-room when their services are more generally adopted. It is only those of us who have been so fortunate as to have at our service a skillful and competent anesthetizer who can fully appreciate the difference in results, both as to the satisfaction of doing our work, the celerity and safety of its execution and the comfort and safety of the patient, both during and after the operation. It behooves the medical profession to arouse itself to the importance of this reform before the public fully realizes the situation and takes the matter into its own hands. And it is befitting us as a scientific and surgical body to once more take

the lead and point the way to the surgical world to the one great reform remaining in the perfection of our technic.

It only remains for me to express to you my gratitude for the appreciation you have shown of my past interest in our common association by making me your president. It has been one of the ambitions of my professional life to hold this honor, the greatest in your power to bestow and one which will for all time be worthy the ambition of any man. And it will always be a matter of intense pride with me to remember the fact that you have designed to associate me with the names of such distinguished men as have presided over your deliberations in the past—Fordyce Barker, Peaslee, Gaillard Thomas, Sims, Emmett, Kimball, Albert Smith, Goodell and many others, immortals of a great and recent past.

2219 DELANCEY PLACE.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

*Thirty-third Annual Meeting, held at Philadelphia, Pa., May 26,
27, and 28, 1908.*

*The President, DR. J. MONTGOMERY BALDY, of Philadelphia, in
the Chair.*

THE Society held its meetings in the Assembly Hall of the College of Physicians and Surgeons on the first day, and on the second and third days at the Bellevue-Stratford Hotel.

An Address of Welcome was delivered by DR. EDWARD L. DUER, of Philadelphia, which was responded to by DR. WILLIAM M. POLK, of New York.

SYMPOSIUM ON IMMEDIATE VERSUS DEFERRED OPERATION FOR
INTRAABDOMINAL HEMORRHAGE DUE TO TUBAL PREGNANCY.

DR. FLORIAN KRUG, of New York, read the first paper in the symposium and said, among other things, that whenever opinions were diametrically opposed to each other on mooted points in surgery, the truth as well as the best interests of the patients were not to be found at either extreme, but usually in the middle.

It could not be conceded that in any case of ectopic gestation, operation should be deferred for as long a period as it lately had been recommended by some, nor should the patient be subjected to a hasty operation in every case, even when the diagnosis had been established beyond a reasonable doubt.

The severity of shock was not always proportionate to the amount of blood lost. Comparatively few patients died from actual hemorrhage. In most cases, termed "tragic" or "cataclysmic," the hemorrhage had been seriously aggravated by trauma—namely, curettage, too vigorous bimanual palpation, etc.

Some patients would die before surgical aid could reach them; others would die in spite of it, and some had died because of it; surgical interference having taken place too hurriedly without proper preparations.

IMMEDIATE vs. DEFERRED OPERATION FOR INTRA-
ABDOMINAL HEMORRHAGE DUE TO TUBAL
PREGNANCY.*

BY

J. E. JANVRIN, M. D.,

New York City.

THE wording of this subject permits a pretty wide field for discussion. It takes in all varieties of hemorrhage due to tubal pregnancy—whether the hemorrhage is *very* slight, as frequently occurs in *unruptured* cases; whether it is moderate in amount, due to partial or slight tears in the tube wall or to a slowly but steadily progressing tubal abortion; or whether it is of large amount, due to a more extensive laceration of the tube; or to a rapid tubal abortion accompanied by profuse hemorrhage and excessive shock.

Since the topic is presumed to be confined to the operative treatment, it is necessary to have somewhat of an understanding as to the actual conditions existing in each variety of impending or actual hemorrhage, and also as to the conditions existing in each individual case, as far as our ability in diagnosis permits. I would like, therefore, to speak first of the *unruptured* variety. It is generally conceded that practically every case of extra-uterine pregnancy is at first tubal in character, and it goes without saying that every case of tubal pregnancy during its early stage is an *unruptured* affair.

Provided we can recognize such cases, what should we do with them?

In vol. xi of the Transactions of this Society, published in 1886—twenty-two years since—I reported a case of tubal pregnancy (which I treated with galvinism, when seven weeks advanced, on three successive days) and in which the sudden death of the patient occurred on the morning of the day following the last

*Read. by Title before the American Gynecological Society, May 26-28, 1908.

application of galvanism from a severe hemorrhage from a rupture of a small artery on the peritoneal covering of the tube.

There had been, some nine days previously, symptoms of a slight internal hemorrhage, accompanied by colicky pains and some shock, and I had diagnosed the case as tubal pregnancy, and *that* was the time when I ought to have done laparotomy, but, going according to our light at that date, I had kept the patient perfectly quiet in the meantime, and at the end of the nine days had applied galvanism, deeming it perfectly safe to do so. The postmortem showed extensive hemorrhage from a slightly torn artery on the peritoneal surface of the tubal sac, but *no rupture* of the sac wall. At that date I was able to find only two similar recorded cases—the first being that of Ollivier's (d'Angers), and mentioned in Parry's work on Extrauterine Pregnancy, and the second reported by the late Professor T. Gaillard Thomas in the Transactions of this Society for 1882. Both cases had succumbed, like my own, simply to the hemorrhage resulting from a minute hole in the wall of a small artery on the peritoneal surface of the gestation sac without any tear of the sac wall.

In concluding the report of these three cases, I urged the absolute propriety and necessity of opening the abdominal cavity "as soon as the diagnosis of tubal pregnancy could be reasonably made, and the removal of the unruptured tube with its contents." I have never been able to find that this had ever been recommended before that date, though for some thirty years prior laparotomy for a *free* hemorrhage accompanied by shock and symptoms of impending death had been urged, first by Professor Kiwisch in 1857 and again by the late Dr. Stephen Rogers, of New York, in 1867, and in 1880 by Professor Thomas, of New York, and by Mr. Lawson Tait in 1883 when he did the first laparotomy for a fully ruptured tubal pregnancy.

At the January, 1887, meeting of the Obstetric Section of the New York Academy of Medicine, when the subject of tubal pregnancy was under discussion I closed my remarks by saying that "in any case in which from the rational and physical symptoms I became convinced that I had to deal with a tubal pregnancy, *even before* symptoms of a rupture in the peritoneal covering of the tube occurred, I should most earnestly urge laparotomy and perform it if I could obtain the consent of the patient. Even if mistaken in my diagnosis, I should find something which ought to be treated surgically."

On April 16, 1888, I read a paper before the Medical Association of the County of New York, taking the same ground, and in September, 1888, I read a second paper before this Society urging the propriety and giving the "Indications for Primary Laparotomy in cases of Unruptured Tubal Pregnancy."

The symptoms given in all of these papers were practically as follows: the presence of an irregular decidual discharge in a woman who had missed a period associated with the normal signs of pregnancy and an enlarging, generally fluctuating and exquisitely sensitive mass upon one side of the uterus, and attacks of "colicky" pains, accompanied by more or less shock, usually quite severe.

I have had several such cases since then and have found several reported by others, and personally I have never had occasion to repent operating at once.

Shortly after my remarks made in January, 1887, several successful cases of the removal of the unruptured tube with its contained fetus were reported, one by Dr. J. S. Hawley, of New York, one by Dr. Howard Kelly, one by Dr. Joseph Price, one by myself. Finally, in the April, 1888, number of the AMERICAN JOURNAL OF OBSTETRICS, over a year and a half after I had first urged laparotomy as soon as a reasonable diagnosis was made and before any rupture of the sac had taken place, and I had given all of the needed train of symptoms to recognize the situation, Mr. Lawson Tait said, "If there be any reasonable supposition that there was a tubal pregnancy which had not yet ruptured, I should recommend immediate operation."

This much for the early history of laparotomy for unruptured tubal pregnancy. I believe that all gynecologists during the past fifteen years at least have fully indorsed the views set forth in my papers of 1886, 1887 and 1888, and have operated whenever the early diagnosis was reasonably certain.

What are the practical conditions obtaining in a case of *ruptured* tubal pregnancy, or in a rapidly impending tubal abortion? The symptoms have been so frequently described during the past twenty years or more that it is not necessary to dwell upon them at any great length. In every case we have the history of local colicky pains, irregular vaginal discharge, cessation of the menses for one month at least and the sudden and well recognized symptoms of internal abdominal or pelvic hemorrhage accompanied by severe shock. The enlargement and exquisite sensitiveness of the fallopian tube which was noticeable before rupture of

the tube or tubal abortion had taken place no longer exists, but we have in their place all the evidences of extravasated blood in the pelvic cavity. The situation is so easily recognized by any surgeon or physician of experience that it is almost impossible to make a mistake in diagnosis.

Under such circumstances, what is the best course to follow? Shall it be immediate or shall it be deferred laparotomy? I take it for granted that we are all agreed that laparotomy is the only proper treatment.

The number of my own cases, though not as large as those of some other operators, has been sufficient to convince me that when once the diagnosis has been made there should be no delay in opening the abdomen. On two occasions only have I delayed the operation, and in each of these (although in one case it was only for six hours and in the other nearly twenty-four) the patients were in decidedly worse shape than when I first saw them. One was a case of tubal abortion, the other a case in which a tear in the wall of the sac about an inch and a half in extent existed. In each case I was prevented from operating immediately by the husband's not being willing to give his consent until even he could see that the patient was rapidly sinking. Fortunately, they both recovered. The condition in such cases is the detachment of the fetus and placenta, especially in tubal abortions; and the death of the fetus quickly follows. From the instant that hemorrhage begins the mother's life is in most imminent danger, and in a large percentage of the cases, unless laparotomy is performed at once, recurrent hemorrhages, more or less severe, take place increasing the already terrific danger under which the patient is laboring. Add to this the fact that the fetus and placenta have become foreign bodies in the mother's abdomen which must be dealt with later on under less favorable conditions, and we have before us a situation demanding, in my judgement, immediate laparotomy. The only item which could militate against it is this, viz., that a good gynecological surgeon is not at hand to perform the operation. Under such circumstances, it may be, and probably is, proper to wait a few hours until such a surgeon can be found.

No doubt, all of us who have had experience in the treatment of ruptured tubal pregnancies have met with such instances. I have had several in localities not far from New York and, though fortunate enough to have saved the patients, I have always felt that if the operation could have been done a few

hours earlier it would have been a decidedly less tax upon the strength of the patient and upon the nerves of the operator.

In the paper which was read by Dr. Hunter Robb at the meeting of this Society in Washington last May there are reported twenty cases of deferred operation, ranging from one to twelve days. In only five of these were evidences of shock noticed—an unusually small percentage. Two of the twenty gave evidences of “adherent pelvic structures” when discharged, and one other died on the tenth day after operation from “volvulus and intestinal adhesions.”

When the laparotomy is done immediately there is practically no possibility of “adherent pelvic structures” or “intestinal adhesions” resulting. The lacerated tubes, together with the placenta and fetus when found and the blood-clots with a large part of the fluid blood, are quickly removed, and with a small amount of manipulation, and we have left nothing behind except a little fluid blood and possibly a minute fetus which had escaped into the pelvic cavity before the operation was begun, neither of which items gave any subsequent trouble, they being taken care of by the absorptive powers of the peritoneum. A rapid operation adds very little to the existing shock and that little can be easily counterbalanced by the intravenous or subcutaneous use of the saline solution should the conditions demand it.

I fully believe that a more decided shock and loss of power for reaction from the operation is sure to follow in cases in which the operation is deferred, whether it be for twelve hours, a full day or longer. Such, at least has been my own experience and observation.

191 MADISON AVENUE.

DR. F. F. SIMPSON, of Pittsburgh, Pa., in the third paper of the symposium, said that in his judgment there could be no rule of thumb, no single plan of action which could be wisely applied to all cases under all conditions.

To indicate at the outset the line of thought his paper embodied he submitted four general propositions: (1) Extrauterine pregnancy was always a grave affection and operation should usually be done at the earliest elective period and under elective conditions. (2) It seemed within the range of possibility that by a readjustment of teaching regarding early symptomatology and prognosis, the vast majority of the cases might be recognized and appropriate treatment instituted during the nontragic, which was the safe stage of the disease. (3) Operation when the patient was acutely ill was always serious. This was particularly true if the operator be unskilled or the surroundings un-

favorable. (4) In consideration of the general subject of hemorrhage, the writings of many operators and his personal experience led him to believe that intraabdominal hemorrhage due to ectopic gestation did not necessarily have as high a mortality as prevalent teaching would indicate.

1. There could be no doubt (a) that extrauterine pregnancy was a grave affection if proper treatment was not promptly instituted. This was abundantly shown by the unrecognized and hence improperly treated cases that go to the coroner. (b) Further, all would admit that immediate operation under elective conditions was safer than the disease, provided it was recognized before rupture or abortion or before a severe hemorrhage had reduced the patient's margin of strength. Even if the patient's reserve strength had been materially reduced by hemorrhage, she might again become a favorable operative risk by a short period of appropriate treatment. Another elective period for operation might thus be reached.

The elective conditions for operation would, in his judgment, invariably include: (1) A patient with a good margin of reserve strength. (2) A competent abdominal operator whose experience with this affection had been both extensive and satisfactory. (3) Skilled assistants and attendants. (4) Appropriate surroundings. (5) Adequate preparation.

So much stress had been laid upon the ghastly picture enacted by grave hemorrhage that relatively few advanced cases went unrecognized to-day.

An analysis of 575 cases of ectopic gestation taken indiscriminately from the literature of the last five years showed some interesting facts. Of that number, operation was done within twenty-four hours of rupture 115 times with twenty-six deaths, or 22.6 per cent. mortality; operation was not done within twenty-four hours of rupture 461 times, with thirty-one deaths, or 6.7 per cent. mortality.

This striking difference in mortality was due to the fact that the cases were not parallel, there being a larger percentage of grave cases where early operation was done; seventy-five patients were critically ill at the time of operation within twenty-four hours, with twenty-six deaths, or 34.6 per cent. mortality; whereas twenty-four patients, equally ill, were not operated upon within twenty-four hours, with seven deaths, or 29.1 per cent. mortality. We thus had a difference of 5 per cent. mortality in favor of deferred operation where the exact plan of treatment was not definitely stated.

In striking contrast to these results of much of the current teaching, namely, the immediate operation with no alternative plan of treatment, he submitted five cases reported by Robb, five cases reported by Stillwagen, and seventeen cases that came under his personal care, all subjected to deferred operation without mortality. In all the clinical picture was typical. In all the quantity of blood removed was sufficient to indicate a

severe hemorrhage—at least, a pint and a half being found in each instance, and more than a quart in most of them. In seven cases the rupture occurred within half an inch of the uterus. In an eighth case he recognized an unruptured interstitial pregnancy and advised immediate operation. The patient did not think she was ill enough for that. Four days later, while at market the rupture occurred. Later the badly damaged uterus and a three-months fetus were removed.

In this series of cases the treatment was definite and systematic. Operation was purposely deferred and, despite the fact that all were desperate cases, not one died either from the disease or from subsequent operation. Thus there were seventy-five grave cases taken from the literature, with 34.6 per cent. mortality from the disease *plus* immediate operation, and twenty-seven grave cases by Robb, Stellwagen and himself without mortality from the disease *plus* deferred operation.

In a series of something more than 100 consecutive cases of extrauterine pregnancy seen in almost all phases of the disease, the author had not seen one patient bleed to death at the time of rupture, although two had died from hemorrhage. A seven-months living fetus was removed from one woman; she bled to death at the time of operation which was done with great skill at a time of choice. One other patient, one of his own, died from hemorrhage *plus* immediate operation. The death-rate in this series of more than 100 cases was slightly less than 4 per cent., there being four deaths in the entire series that had come under his observation.

The author drew the following conclusions:

“1. Extrauterine pregnancy is always to be looked upon as a serious affection, although not necessarily immediately fatal.

“2. It usually requires operation. Pending that procedure, the patient should be handled with extreme care.

“3. Operation, when a patient is acutely ill, is always serious. This is particularly true if the operator be unskilled or the surroundings unfavorable.

“4. The decision for immediate operation is at times entirely proper, but it should rest upon a low mortality for such operations in the individual operator's hands, rather than on an essentially high mortality the disease has been credited with having.”

DR. HIRAM N. VINEBERG, of New York in the fourth paper of the symposium said that in discussing the subject of the treatment of intraperitoneal hemorrhage from tubal rupture or abortion we must take into account the amount of blood effused into the peritoneal cavity in each individual case. This varied within very wide bounds, depending upon the portion of the tube which had been ruptured or eroded. In tubal abortion the quantity of blood poured into the general peritoneal cavity at times might be very great, equaling in amount that occurring in the most severe form of tubal rupture. This was not a

matter of mere theory but of actual observation by different operators. The raw area of a tube which had ruptured or had been eroded would go on bleeding for an indefinite time, or the bleeding might cease for a time, to be renewed again after the lapse of a variable period. This renewed bleeding might take place while the patient was at rest in bed, and had been known to occur even while the patient was asleep. Of course, it was more likely to occur after some slight exertion or after a bimanual examination which need not be carried out with any undue violence. In the vast majority of cases the amount of blood effused into the abdominal cavity, either from abortion or rupture, was not so great as to be a direct menace to the life of the patient. Still, with the lesser degrees of intraperitoneal hemorrhage, the attendant symptoms might be quite alarming and might simulate in a marked degree those attendant upon the more copious effusions. There would apparently be the same degree of pallor, the patient might go into apparent collapse and the pulse might become imperceptible. But in these cases reaction would occur within a comparatively short time. The acute observer would be able to note in these cases that the symptoms of collapse were due to the shock attendant upon the impact of blood upon the peritoneum rather than to acute anemia. Whether we operated upon these cases, forming about 95 per cent. of all the cases that came to the operator, shortly after the hemorrhage had taken place or waited for a day or two to suit the exigencies of the case or the convenience of the operator or the service in the hospital, in his opinion, mattered but little. Theoretically, the results ought to be better if time were taken for the preparation of the patient. So far as his own experience had gone, his emergency patients had gotten well equally as satisfactorily, and often more so, then when they had been subjected to preparations for a couple of days before the operation. He thought we had learned from last year's discussion in this society that the active preparation of the patient prior to laparotomy, on which many laid such stress, was a fetich and often did more harm than good. This he did know, that since giving up the active purgation and preparation of the patient formerly in vogue in the hospital, patients had suffered much less from meteorism and other discomforts following abdominal sections. From what he had said thus far it was evident that there was not much room for a difference of opinion as to the time of operation in about, roughly speaking, 95 per cent. of the cases, that was if we assumed that all cases of tubal rupture or abortion ought to be operated upon. Whether this assumption was a correct one would be discussed later.

It was, then, in the treatment of the remaining 5 per cent. that the bone of contention was to be met. This percentage was composed of the cases of tubal abortion or rupture in which the amount of blood effused was so great as to inundate the entire abdominal cavity, distending it to its greater extent, pushing

the diaphragm upward to such a degree as to seriously crowd the heart and lungs and placing the life of the patient in the greatest jeopardy or killing her outright in from one to twenty-four hours. These cases the writer had termed "cataclysmic" from the suddenness of the event and from its overpowering character. In operating upon them it was like cutting through the abdominal wall of a corpse, the tissues being practically bloodless. When the peritoneum was reached it was found of a very dark color and bulging outward, and when incised the blood spurted out with considerable force. The patients were either apathetic and partly or wholly unconscious or were restless and in great anxiety. The countenance was of a sickly livid color or deathly white, the mucous membranes of the lips and eyes were completely blanched and the pulse was very small, soft and rapid or was totally absent in the vessels at the wrist. The only case in his experience that died from intraperitoneal hemorrhage was the one he did not operate upon, not being able to obtain consent until it was too late, while the other six cases operated upon immediately made prompt recoveries. He had only one death in the entire series of eighty-four cases, and that patient died three weeks after the operation from an ether pneumonia.

As an argument in support of the assertion that patients rarely died from hemorrhage in ectopic pregnancy, an analogy had been drawn between the hemorrhage in gastric ulcer and intestinal perforation in typhoid. It was stated that death from hemorrhage in these conditions was extremely rare. The most recent and reliable statistics, those collected by J. H. Musser in his paper before the Congress of American Physicians last year, showed in this connection that the mortality in acute large hemorrhage in gastric ulcer was placed by Musser at 2.24 per cent. Osler, quoting the result of 2000 autopsies in typhoid in Munich, stated that death occurred from hemorrhage of the bowel in ninety-nine cases, that was in over 20 per cent. It was the cause of death in eleven cases in fifty-six deaths in Osler's cases, which was also about 20 per cent. In perforation of the intestines in typhoid there was practically no hemorrhage, and the mortality of this complication was caused by peritonitis. The analogy, therefore, was not a happy one. R. Werth, of Kiel, whom no one would accuse of not being conservative, said in this connection, "Operative gynecology had affected a genuine triumph in instituting an active treatment in the life-threatening hemorrhages within the peritoneum consequent upon tubal rupture, more rarely upon tubal abortion. Formerly we stood helpless in the face of such a catastrophe, and at least 80 per cent. of the victims succumbed to it." No one would deny that the patients rarely died from the first intraperitoneal hemorrhage, for the bleeding would generally cease when the heart's action was greatly depressed, but the eroded vessels would begin to bleed again as soon as the heart regained some

of its power. It required but a little extra loss of blood to extinguish the life of these patients. The question of shock, in these cases, was to his mind a bugbear which need not be taken into serious consideration.

He thought a gynecologist would be taking a long stride backward in surgery if he were to adopt the measures of delay recently advocated with such warmth. He would be going back at least twenty-five years if he deemed it necessary to place patients in a state of hibernation for six or seven weeks to build up the "reserve force" so as to withstand the ordeal of an abdominal section for a condition which in most cases calls for the simplest technic. What was there easier and simpler in gynecological surgery than the technic necessary for a recent rupture of an ectopic tube? The only skill necessary was that no undue violence be used, so that the broad ligament which might be very friable might not be torn, and that the ligature be applied tightly so that no further hemorrhage would take place, and that too much time be not lost in trying to cleanse the abdominal cavity of its blood and blood clots.

IMMEDIATE vs. DEFERRED OPERATION FOR INTRA-ABDOMINAL HEMORRHAGE DUE TO TUBAL PREGNANCY.*

BY

E. E. MONTGOMERY M. D.,

Professor of Gynecology, Jefferson Medical College, Philadelphia.

CHARLES D. MEIGS, writing in 1848, said that he had seen three cases of tubal pregnancy, all of which died before the third month and that he would not expect any case so affected to live over the third month. He did not believe that a tubal gestation would ever be suspected until it had burst and begun to bleed. Further, "If a woman should experience the signs of pregnancy, such as change of the aureole, nausea, pica and malacia, growth of the breasts, extraordinary sensations within the pelvis, etc., and thereupon, when having attained to the middle of the second, or to the third month, be seized with horrible pain in the hypogastrium and pelvis, turn pale, lose the pulse and faint, I should suspect the rupture of a tube-sac of extrauterine pregnancy." He indicates other conditions, as typhlitic calculi or intestinal perforation, which may cause like symptoms, and proceeds, "But in case they should continue and increase with signs of concealed hemorrhage as to leave no doubt of imminent death, I think the diagnosis could not be other than a ruptured tube-sac of gestation. Such a diagnosis would not lead to any helpful

*Read before the American Gynecological Society at Philadelphia, May 26-28, 1908.

therapeutic or surgical intervention, for nothing is to be done in these melancholy cases beyond the adoption of mere palliative measures. No man would be mad enough, under such diagnostic, to perform a gastrotomy operation, with the expectation of finding in a tube-sac in the pelvis an embryo as large as a reed-bird." In the same year discussing the same subject in his work on "Females and their Diseases," he exclaims, "What, alas! can we do in these cases? We could make an incision in the abdomen and clear away the coagulum and serum. But who is bold enough to do so? Who is he astute enough to discriminate betwixt all the possible causes of such phenomena with so much clearness as to warrant him in the performance of a gastrotomy for fallopian pregnancy? There is no such wise and bold surgeon; and, therefore, nothing remains for us but to extend all to the relief within the narrow boundaries of our power and calmly await and submit to the inevitable end." Is it surprising that, under such hopeless circumstances, he should continue, "A physician may be calm and even cheerful, but a merry doctor is a very singular phenomenon." Thanks to the development of surgery our horizon is a much brighter one.

Possibly, owing to the deleterious influence of advancing civilization on women, ectopic gestation occurs with much greater frequency than in the time of Meigs, but we no longer regard it as presenting a hopeless outlook.

The limits of this discussion do not permit me to consider the causes and varieties of ectopic gestation, but I must confine it to the significance of rupture and the general plan of treatment to be employed. The one ever-dreaded termination is that of internal hemorrhage which may be slow and small in amount, or so profuse as to threaten life or even cause the death of the patient. Hemorrhage may occur in one of four ways:

1. It may be the result of rupture of the tube, either into the peritoneal cavity, when it is free and may be excessive, or into the broad ligament and is necessarily limited in quantity.
2. The development of the embryo within the tube so thins its walls that the chorionic villi may project through pin-hole perforations and cause dangerous and continuous hemorrhage.
3. A partial separation of the embryonic sac may occur and hemorrhage fill the tube escaping from its abdominal end and through the uterine end into the uterus. In this form the clotting takes place early in the tube and the quantity of blood lost is slight.

4. The fetus and its envelope may be forced through the abdominal end of the tube into the peritoneal cavity—a tubal abortion. This accident is not infrequently associated with very profuse bleeding.

In the four conditions above described the hemorrhage may be slight or be very severe. The most active and threatening hemorrhage is most likely to be associated with the first and second divisions.

In the majority of cases of ectopic gestation, the hemorrhage if untreated would not prove fatal. Very rarely, in the cases formerly supposed to have been cured by the systematic employment of the galvanic or faradic current, was the fetus alive at the time of the application, the fetus having already met death through the rupture of the sac. The symptoms regarded as diagnostic of ectopic gestation were those incident to rupture, as diagnosis prior to rupture was not then regarded as possible. The electrical treatment, consequently, was applied to the pelvic collection of blood resulting from the rupture and the cure consisted in the removal or absorption of the clots. It was doubtful whether the absorption under the treatment was any more expeditious than it would have been had no treatment been employed. With the shock and diminished arterial tension incident to the rupture of a tubal gestation-sac, the tendency to the formation of a clot, the probability of the arrest of hemorrhage is increased. In many cases, this arrest occurs before a hemorrhage of any severity has ensued and the patient so rapidly recovers from the indications of an internal hemorrhage as to leave the diagnosis in doubt. The amount of hemorrhage and its consequent danger will depend somewhat upon the site of the rupture and the existing condition. Rupture of a considerable-sized vessel, or over the implantation of the placenta may produce a hemorrhage of such gravity as to lead to dissolution before any preparations can be made for an operative procedure. Bleeding from pinhole perforations of the chorionic villi may be so severe as to cause faintness which recurs with every increase of the vascular tension until the life forces of the patient are completely sapped.

That fatal hemorrhage does occur from ectopic gestation has been too well demonstrated to admit of denial. The records of the coroner's physicians of all our large cities and the experience of many physicians has abundantly proved this. In such cases, prompt action will prove the sheet-anchor. It is just as im-

portant that the bleeding tubal vessel should be secured as if a vessel of equal size upon the surface were the cause of the hemorrhage. It is true, that an external hemorrhage may be controlled by pressure, or hemostatics, but such treatment would not be considered as good surgery.

Under the decreased tension from shock, the bleeding vessels of the ruptured gestation-sac may become occluded by clot and further hemorrhage arrested, but the surgeon has no assurance that the favorable termination will result in the case under observation. Measures which would ordinarily be employed for rallying the patient from profound shock are reprehensible here, as the only hope for the patient outside of operation is with decreased vascular tension the clotting of blood in the bleeding orifices will become so firm that it will act as an efficient barrier against further hemorrhage. Intravenous injections of salt solution, heart stimulants or any measures to improve the circulation are unjustifiable until the bleeding vessel can be secured as by endangering the displacement of the clot they increase the peril of the patient. For a similar reason the patient who has had a free internal hemorrhage should not be subjected to manipulation for diagnostic purposes. In these cases we must rely on the history and the visible physical signs, supplemented, if desired, by blood studies for the diagnosis.

1703 WALNUT STREET.

IMMEDIATE vs. DEFERRED OPERATION FOR INTRA- ABDOMINAL HEMORRHAGE DUE TO TUBAL PREGNANCY.*

BY

C. C. FREDERICK, B. S., M. D.,

Buffalo, N. Y.

THE necessity for a decision to be made between immediate and deferred operation for intraabdominal hemorrhage due to tubal pregnancy is quite rare, or has been in the writer's experience, owing to the fact that diagnosis of the existence of ruptured tubal pregnancy by the family physician has been made late, seldom within the first three or four days after primary rupture and often as many weeks thereafter. Out of about 125 cases of ruptured tubal pregnancy, the writer has seen in only six cases the hemorrhage immediately following rupture large enough

* Read before the American Gynecological Society at Philadelphia, May 26-28, 1908.

to endanger the life of the individual. Three were in extremis when first seen and were immediately operated upon, meantime using every possible means of stimulation to tide them over the operation. Operation was rapidly done, but all died in shock.

Having had such bad results in the first three, the writer in the fourth case decided to stimulate and wait. She also was in extremis, almost pulseless, ten hours after rupture. She did not rally and died three hours after I first saw her. The fifth case was seen about two hours after rupture; patient's pulse was countable at 120; both heart sounds quite clear, but the patient was much shocked. Advised stimulation and normal salt solution subcutaneously. Patient rallied for a time, but began to fail in another hour and I, being busy with other work, another surgeon was called in and at once operated, saving the woman's life. A sixth case operated upon about five hours after rupture, while suffering much from shock, made a good recovery.

It therefore appears, from my experience, that only about 5 per cent. of ectopic pregnancies are accompanied by a dangerous hemorrhage at time of rupture. In the remaining 95 per cent., as the result of shock and lowered vascular tension, together with the small size of the vessels torn, the bleeding is normally controlled, at least temporarily, by coagulation. Later, when vascular tension again rises and the patient begins to move about, the hemorrhage may and generally does recur. The writer has operated two cases in whom hemorrhages had recurred at frequent intervals for five or six months respectively, the patients being about the size of normal pregnancy; the mass being composed of concentric layers of coagula. On the other hand, I have seen several patients in whom there was an undoubted rupture of a pregnant tube, with hematoma in the pelvis, in whom hemorrhage did not recur and who were not operated and made perfect recoveries. The author has operated upon, at least, four women who had chronic pelvic lesions, following a clear history of unoperated former ruptured tubal pregnancy, in whom the remains of the ectopic gestation were found, some of them several years following the accident. All of these facts go to show that a very small percentage of ruptured tubal pregnancies is immediately dangerous to life from hemorrhage.

But, the question still remains, when we are brought face to face with a rupture, is this one of the 95 per cent., which will be self-limited, or is it one of the 5 which will kill the woman.

The condition is much like acute appendicitis, we never know at the beginning what is going to happen.

Theoretically, we may consider these cases scientifically, by making an examination of the hemoglobin index frequently and determine if the hemorrhage is progressive, at the same time, having repeated counts made of the red blood-cells to determine if they are diminishing progressively.

These procedures are not practicable under the conditions ordinarily encountered at the time these patients are seen. Theoretically, we ought to be able to determine accurately if bleeding is continuing; but, practically, we are not able to do so. It has always seemed to the writer that bleeding, whenever endangering a patient's life, if it can be controlled, should be controlled. It is a surgical principle from which it is difficult to get away. It therefore has always appealed to me to be good principle to open the abdomen in these cases as soon as seen, using all possible known means of stimulation during the operation; that is, if the patient's condition is one of danger, otherwise, if the patient does not show profound shock from hemorrhage, I should advise waiting till she rallies.

It would seem, considering the results I had following immediate operation that it was the wrong thing to do. I, however, believe that they would have died if they had not been operated upon when I saw them. Undoubtedly, the large proportion of cases of rupture will do better if allowed to wait till bleeding ceases spontaneously; but, I feel that there is a small percentage of instances, when the bleeding vessel is so large that spontaneous control is impossible, where immediate operation is the only chance to save the patient's life. We therefore are forced to the conclusion that no definite rule can be laid down for all cases. Each must be judged of according to the conditions present, remembering that there are 95 chances of the hemorrhage ceasing to about five of its going on to a fatal termination.

But we must not wait in these few cases till there is no vitality left upon which to depend during operation.

64 RICHLAND AVENUE.

DR. EGBERT H. GRANDIN, of New York, in the seventh paper of the symposium, said that his initial experience with ectopic gestation was when he saw the late Paul F. Mundé treat a number of subjects by means of electricity. This was the method then in vogue in this country. He recalled well one of the instances when the late T. Gaillard Thomas was the consultant. The sub-

ject went into deep shock and required his attendance at her bedside for over thirty-six hours. She recovered, as, indeed, did all the others he saw subjected to this treatment. He questioned now if it could be maintained with a show of exactitude if some of these cases were instances of ectopic. In all justice to the observers of those days, he wished to state that abdominal section was then a rarity for any condition.

Imbued by this teaching, he proceeded to treat instances after this electrical fashion. In 1892 he saw a case of ectopic with the late Dr. Little, of Astoria, administered electricity, and the woman promptly collapsed. She recovered. Such experience set him thinking, and, after fighting the subject out, particularly with his honored associate, Dr. Janvrin, he saw a great light, and from that day to this there had been but one treatment for that condition at his hands, and this was the surgical just as soon as the evidence of its existence was fairly presumptive.

It so happened that the very first opportunity he had to show his change of heart was on the woman referred to above as having been electrified by Dr. Little. He sent the woman to the French Hospital and there performed the first deliberate abdominal section for ectopic ever made in that institution. He found an unruptured ectopic on the left and a diseased tube on the right, the side he had presumptively cured of ectopic by means of electricity about two and one half years previously. Since that time he had operated upon or been chief consultant at operations upon over one hundred instances, not including hematocele formation. Placing the number seen at one hundred, in order to secure definite percentage, the only instances which had died, —two in number—were where expectancy ruled. He had no record of the number of hematoceles he had seen, but he recollected distinctly two deaths, the women having reached him *in extremis*, although the history pointed unerringly to the fact that abdominal section had offered distinct indication at least ten days previously.

Now, such being his personal experience, he maintained that prompt surgery should convert that malignant disease into one carrying the certitude of recovery, other things, of course, being equal. He would also maintain that ideal surgery is to operate before rupture. To go further, he would maintain that operation should be resorted to on presumptive evidence, it being his preference to be proved wrong in diagnosis rather than to sit on the fence waiting for the diagnosis to be made at the time of rupture. In three instances he had applied this rule, and while he did not find ectopic he did find diseased tube and ovary. He further maintained that the only logical, safe and surgical method of treating these cases was by operation through the abdomen, the vaginal route being reserved for diagnosis and for hematocele formation. In the latter event—hematocele—he maintained that in the absence of suppuration

in the presence of requisite vitality on the part of the subject the proper course was to open the abdomen and to exsect the damaged broad ligament. He had done this in a semitenement house with recovery.

He stated that the instances he had seen and which formed the basis of the above-expressed views had been of all types, ranging from unruptured instances to those where the abdomen was full of blood, even up to the ensiform cartilage.

Those who favored delay under such conditions argued somewhat as follows:

1. It was contended that the subject rarely died as the result of the first hemorrhage. This was freely granted; but what means were there of determining that the hemorrhage had ceased. And how were we to know that a second hemorrhage was not imminent? Often, and this he had proven in the operating-room, the first hemorrhage was into the sac or perhaps consisted of extrusion of a slight amount of blood into the cavity. This was often sufficient to cause collapse, not so much because of the amount of blood lost as from the peritoneal irritation. Clinically, primary rupture, or primary abortion, was only a prelude to secondary hemorrhage. Applying the expectant treatment to instances of primary rupture, with the therapeutic measures which were naturally resorted to, blood-pressure was of necessity raised and thus assisted in causing secondary rupture. Therefore, from his point of view, operation should be performed as soon as feasible after symptoms of rupture where one was unable to reach a diagnosis before rupture.

2. It was contended that, analogically, subjects of hemorrhage from the stomach or as the result of typhoid perforation or from uterine fibroids rarely died at once. This was granted, but the analogy was a weak one, since the surgeons with whose work he was familiar, in case of typhoid perforation for instance, operated at once and did not wait for a second perforation. Similarly, he would act in cases of gastric hemorrhage, and as for fibroids of a hemorrhagic type everyone agreed that the earlier the operation, the less the mortality rate, since the interstitial changes in the heart and kidneys were thus avoided. Repeated hemorrhages into the peritoneal cavity only rendered the operation more difficulty and more prolonged, so that, other things being equal, the longer the wait the lower would be the recovery rate.

3. It was contended that expectancy enabled us to secure better surroundings, more instruments, more competent assistants. This was the argument of the pure hospital surgeon. He could not gainsay the comfort derived from having all these attainments, but those present who had operated in tenements for this condition would agree with him that however much such attainments might be desirable, they were not necessary. He was not afraid of surroundings, provided he could sterilize the field of operation. Few instruments were requisite: trained assistants were not necessary. The surgeon, having confidence

in himself and his knowledge, need only get into the abdomen, tie off the damaged tube, and get out of the abdomen. The peritoneal cavity would take care of blood clots better than it would stand repeated insult from over-zealous and unnecessary manipulation. After the bleeding point had been tied off, so to speak, then was the time for stimulation. He had thus operated from choice with the pulse over 160 and had never regretted it as much as he had wept, metaphorically speaking, over the subjects brought to him after expectancy had ruled. His desire was, like a skillful general, to strike the first blow at the enemy—in this case death—and his own personal results, observations and thought taught him the value of decision and action as opposed to wavering and expectancy. In any other part of the body, in the face of hemorrhage, there was no waiting for clotting and rallying, trusting to the element of luck that the hemorrhage might not recur. The same rule, and for weightier reasons, should be applied to the peritoneal cavity.

THE TIME TO OPERATE IN INTRAABDOMINAL HEMORRHAGE DUE TO TUBAL PREGNANCY.*

BY

W. P. MANTON, M. D.,

Detroit.

NOT many years ago the dictum went forth that all cases of appendicitis must be operated on as soon as diagnosis was made. Riper experience and a closer analysis of cases and results have modified these views so that today no surgeon of experience would for a moment think of following so restricted a rule of practice.

In attempting to answer the question as to the time to operate in ruptured tubal pregnancy we are confronted by a proposition somewhat analogous to that which occupied the attention of surgeons concerning appendicitis in the earlier days; the essential difference being that the former had been recognized and described during nearly a century and a half, while the latter has been known for hardly more than two decades. Our knowledge of tubal pregnancy has been one of slow growth and the evolution of surgical technic has been more gradual. Lawson Tait, who did more than any modern operator to direct attention to the dangers of ectopic gestation, declared that he had "never seen an intraperitoneal hemocele that was not due to ruptured tubal pregnancy," but Werth and a host of others have shown that tubal abortion is a much more frequent cause of the blood

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escape than rupture of the tube. The conditions given by Antoine Petit in the latter half of the eighteenth century as pathognomonic of tubal gestation are no longer considered worthy of attention, while the classical symptoms laid down for guidance in the text-books of only a few years ago have had to be largely overhauled, modified and corrected in present-day literature. Atypical symptoms of misplaced conception are at present so frequently registered that, while certain manifestations may be taken as of positive evidence, the general and special expressions of the condition are often so obscure as to mislead even the most acute. Surgical intervention is not infrequently attempted too late, and the operation has to bear the *onus* of untoward results, or abdominal section gives the only means of arriving at a correct diagnosis. All of this goes to show that our knowledge of the symptomatology of tubal pregnancy is constantly changing and enlarging. With all the shifting diagnostic presentations, however, the original advice as to the method of treatment remains practically unchanged. It has been repeatedly pointed out that there are five stages of ruptured ectopic pregnancy in which the physician sees the patient and decides on the course of treatment to be pursued:

1. The so-called fulminating cases in which the blood is poured out from lacerated vessels, the result of rupture of the tube or complete expulsion of the ovum from the ostium abdominale. These cases are associated with the evidences of large blood loss, preceded or accompanied by more or less severe pain, pallor, small thready pulse, profound shock and physical collapse.

2. Cases in which repeated attacks of pain are felt in the lower abdomen, together with faintness, possibly vomiting, and more or less shock and prostration, but in which the blood loss at any one time is slight; a condition which has been aptly described as "tubal drip." Such manifestations are not infrequently met with in partial rupture of the tube or partial tubal abortion.

3. Cases in which rupture of the tube has taken place and a hemocele has been walled off from the general peritoneal cavity.

4. Old cases in which the effused blood has been wholly or partially absorbed, leaving behind the products of conception surrounded by a more or less distinctly defined exudate.

5. Cases in which the products of conception having escaped from the tube continue to develop.

In the first instance it seems to me that there can be no reasonable question as to the proper method of procedure, the method recommended by Goupil more than fifty years ago, "stop the hemorrhage." In the best interests of the patient, therefore, the immediate operation is demanded in these cases.

It is well enough to say that, if left alone, the bleeding will cease of itself, and deferred operation can then be undertaken under more favorable circumstances. In many instances this is true, but it is not true in all, and the anatomical arrangements are not favorable to such desirable termination. Recent advances in our knowledge of the implantation of the ovum have thrown much light on this important point. The not infrequent records of cases in which the unfortunate woman has bled to death should deter from procrastination in this tragic event. Those who claim that death rarely takes place under the conditions mentioned should study the cases reported before the operative treatment of extrauterine pregnancy was inaugurated. Goupil, from a large experience both before and after death in this condition, concluded that "all cases of intraperitoneal hemorrhage arising from extrauterine pregnancy end in death." Parry gives the mortality under these conditions as about 68 per cent., with probably 53 per cent. due to rupture. Presumably, the ectopic gestation of today originates in the same way and follows the same course, or would if let alone, as it did in 1848. If these observations are considered antiquated and doubt still exists, reference to current medical literature will show yearly a sufficient number of fatalities from intraperitoneal hemorrhage incident to tubal rupture or complete tubal abortion to convince, it would seem, the most sceptical. In recent years many more deaths would probably have taken place but for the prompt and timely intervention of surgery; and the mortality following operation is steadily decreasing in the hands of the best operators under improved technic.

Are we justified, then, in assuming the responsibility of advising expectant treatment in these cases in the face of such threatening grave dangers? I think not.

In the second class of cases, where the amount of blood is often small but the extravasations are repeated, unless the patient can be kept under the most careful surveillance, the sooner operation is undertaken the better. While it cannot be denied that the surgical procedure may often be deferred with possible safety to the patient, it is also certain that no one is in position

to determine when a serious or even fatal hemorrhage may supervene, so that the sooner the dangerous and offending part is removed the better for the patient.

To sum up: in determining the course to pursue in the treatment of intraperitoneal hemorrhage due to tubal pregnancy, a rare judgment fortified by experience is demanded. While no golden rule will lead the surgeon to success, accumulated experience demonstrates that where there is free blood in the peritoneal cavity and hemorrhage going on, the sooner operation is undertaken the larger are the chances for rescuing the patient. It is literally true in the management of this calamity that "The man that wandereth out of the way of understanding shall remain in the congregation of the dead.."

32 ADAMS AVENUE, WEST.

FORTY-ONE CASES OF TUBAL PREGNANCY WITH TWO DEATHS.*

BY

A. LAPHORN SMITH, M. D.,

Montreal.

Surgeon-in-Chief of the Samaritan Hospital; Gynecologist to the Western General Hospital and to the Montreal Dispensary; Consulting Gynecologist to the Women's Hospital; Fellow of the American, British and Italian Gynecological Societies.

As a detailed account of each of these forty-one cases would be too tedious for a short paper and as they have all been reported in the local medical journals from time to time as they occurred, I will only take up your time by describing the most striking ones and especially the two who died. I also wish to mention three other cases which came within my knowledge, but were not operated on by me, and so are not included in this series of forty. When we consider that this condition was described in the eleventh century, but remained a pathological curiosity until twenty-five years ago, it is simply marvelous to watch the progress made during the last quarter of a century. To Lawson Tait, of Birmingham, we owe much for having pointed out that tubal pregnancy was never a medical, but always a surgical disease. Although he confessed that it could never be diagnosed before rupture, many of his disciples have improved upon his teaching, so that it is a common occurrence now to diagnose or rather suspect a tubal pregnancy and remove it before that tragic disaster happens. On this continent we owe a good deal to the

*Read before the American Gynecological Society, at Philadelphia, May 26-28, 1908.

vigorous teaching of one of Tait's pupils, Dr. Joseph Price, of Philadelphia, while many others of us by reporting our cases, whether successful or not, have influenced the whole body of family doctors to keep the condition constantly in mind, so that it is the exception for any of them to allow a woman to die with the condition unsuspected.

I lay great stress on the word "suspected." One of the greatest obstacles to the saving of life was the old and to some extent very proper rule to wait until an exact diagnosis could be made before doing anything. If I am able to report forty-one cases, it is because I have induced a great many physicians in my neighborhood to abandon this rule and to set the life-saving machinery in motion the moment they *suspect* the condition. The first wheel in that machinery is a consultation with an abdominal surgeon, who, in turn, should take the next step, namely to open the abdomen as soon as he has verified the suspicion. One of my two deaths was entirely due to my waiting for a more certain diagnosis from the third till the ninth month, instead of making an exploratory incision when the condition was first suspected by a practitioner who had already diagnosed seven or eight cases, some of them before rupture, and every one of whom recovered.

Professor Schauta, of Vienna, has recently collected a series of statistics covering a period of twenty years, showing that the mortality has been reduced from 87 per cent. in those cases which were not operated on to 5.7 per cent. in those which were. My own mortality is exactly 5 per cent. Fifteen or twenty years ago, practitioners were sometimes met with who were either sceptical about such a condition ever existing at all or who did not believe in it enough to advise an operation before or even after rupture. Such men were a great menace to the life of any of their patients who might be going about with disaster overhanging them so I have taken great pains to induce each one of them to be present at an operation when a gallon of clots and liquid blood was being scooped out of the abdomen of a dying woman, as after once having seen such a case they become quickly converted and begin to look out for such a case themselves. To give an instance of scepticism: about twenty years ago I was called to the wife of a mechanic to attend her in labor at full time. On examination I felt the child's head through the vagina and the uterus pushed up against the abdominal wall so that it could be clearly outlined by bimanual palpation. On telling the family that it was an

abdominal pregnancy and explaining what that was and asking for a consultation with an abdominal surgeon, they promptly dismissed me from the case and put her in charge of a physician who had the largest practice in the city. He told them he had never heard of such a thing and that this was an ordinary labor and would terminate in the ordinary way. She had three days of severe pain without any baby, and then everything quieted down and she was told that it was only a phantom tumor she had had. I followed her up for about three years and then lost sight of her. Another instance: about ten years ago, a woman in the east end of Montreal was taken with severe cramps and fainting after eating heartily of some indigestible food. A neighboring doctor was called in who pronounced it a case of indigestion, for which he prescribed an emetic. This brought up what she had eaten, but instead of improving her condition she became so much worse that they dismissed that doctor and called in another of some reputation in medicine. He realized that the condition was serious, but thought that it was some acute nervous attack, as the woman was tossing about and crying out that she was dying. He called in an older man who inquired about pregnancy, but as she had not missed a period and on the contrary had menstruated twice in the last month and was even then losing a little, he dismissed that proposition. His diagnosis was ulceration of the stomach. By this time the woman was really dying, and she received the last rites of the church. Then and only then did they find a doctor who had tubal pregnancy always in his mind. Dr. Warren, one of my pupils, who was called had assisted me at half a dozen laparotomies for abdominal hemorrhage, and recognizing the condition at once he gave up his practice for the whole day overcoming the many difficulties and obstructions which are always thrown in the way of the man who proposes to do something out of the ordinary. When at last she reached the operating table she was pulseless, almost unconscious and hardly required any anesthetic, so that her distended abdomen was hurriedly washed up and opened. The blood gushed forth, and each tube and ovary was in turn fished up and examined without finding the source of the hemorrhage. Then the uterus was brought up, and there in the left cornu just where the tube passed through the uterine wall there was a ragged tear from which even then bright red blood was oozing. Inside of this tear was a cavity which would have held a gypsy nut, lined with a velvety, bleeding membrane, which was scraped out

with the handle of a scalpel, and the bleeding was easily and quickly stopped by passing three or four running stitches of strong catgut under it which completely shut off the blood-supply. About five minutes more were spent in scooping out the blood and clots, about a gallon, no attempt being made to remove all the blood; a gallon of hot salt solution was poured in and the incision closed with through-and-through sutures. By next day, although as white as wax, she was feeling well and she made a rapid recovery. She has had several children since.

That I had the courage to operate on this and on two other women who were brought to the Samaritan Hospital moribund I owe to a lesson I learned from Dr. August Martin during one of my visits to Berlin. I had left some special delivery cards with my address on them with the janitor of his immense private hospital in Elsässer Strasse, and one Sunday afternoon I found a hurry-up call to an operation. There was an apparently dead woman on the table, no pulse and just barely breathing. Nevertheless, he quickly opened and the accumulated blood spurted in the air. In a few seconds more he had in his fingers the ruptured tube which was feebly spouting blood. He clamped and tied, took out some clots, poured in some saline and closed. I saw this woman walking about a few weeks later. The other case was almost as bad, but also made a good recovery. Since then there is no case so desperate that I have not been willing to open. I have mentioned that I have had three cases come to me that were not operated on by me; I have described one as the false labor at full time; now I will speak of another which decided a question for me which was being discussed then, ten years ago, and is being discussed now, namely, when to operate. I was called out one frosty morning to one of the suburbs to see a very sick woman who, on getting up before six to prepare her husband's breakfast, was taken with cramps and she fell fainting on the floor. Before I saw her, even while the words were coming out of the telephone beside my bed, I said to myself that sounds like a ruptured tubal pregnancy. Nearly an hour later one look at her confirmed the diagnosis. She was deathly pale and anxious-looking and spoke in gasps. She thought she was two months pregnant by the feeling in her breasts, although she had had some irregular hemorrhages during that time. On examination, the uterus was found empty and a boggy mass could be felt on one side. She absolutely refused to go to the hospital so I decided to operate on her there, but I made the mistake of going

home to get a few instruments instead of borrowing a knife and some catgut and a needle from the nearest doctor or druggist. When I came back in about an hour with a nurse and some instruments I found her gone: some friends had been summoned soon after I left and had called the ambulance of one of the hospitals without asking her, and when it came she was unconscious again and she could not object. So, although she was operated on and made a good recovery, she is not included in my list.

The third case which does not appear in my list was so interesting that I must say a few words about it. She was a woman who had been married six or seven years without any children, probably due to a gonorrhoeal salpingitis soon after her wedding. Her menstruation had changed from being very regular to coming on several times a month, and she had been suffering a great deal of pain in one side. A friend of hers, to whom she told her symptoms and who was then attending my office for local treatment, advised her to accompany her there for an examination that evening. They came, but unfortunately for her, I had just left for Philadelphia to spend a month with Joseph Price. On her return home about 8 P. M. she proceeded to finish her ironing, but she never got that far, for on lifting the iron from the stove she was taken with a sudden pain and fell with a scream to the floor. The friend who was still with her ran out for the nearest doctor. He was a fine old gentleman, but had never heard of tubal pregnancy, so he told them she was dying from heart failure and that nothing could be done. When the husband arrived about nine he called in another doctor a middle-aged man who had heard of tubal pregnancy, but did not think of it in this particular case. But he came nearer to the truth, for he diagnosed internal hemorrhage and determined to have a postmortem next day. So she lay there slowly bleeding to death until 3 A. M., when she died. The abdomen was opened at 10 A. M., just twelve hours too late to save her life, and was found full of blood from a ruptured tube. Although she came to me I never saw this woman dead or alive, so she does not appear on my list. But I believe that if I had been home the tube would have ruptured while I was examining her in my office and the abdomen would have been opened a few minutes later and in time to save her.

In justice to both these gentlemen it must be remembered that this occurred twenty years ago.

Lawson Tait thought and taught that tubal pregnancy could

not be diagnosed before rupture, but here is a case to the contrary: A woman came to my clinic at the Montreal Dispensary complaining of pelvic pain. As she had been ten years married without children and I could distinctly feel the swollen tubes, I treated her twice a week with Churchill's iodine and boroglyceride tampons. She improved slowly the tubes becoming smaller from week to week until one day she stated that for the first time in many years she had missed her monthly period. I supposed that one of the tubes had improved so much under treatment that it had become pervious and allowed an ovum to pass into the uterus. The latter organ, however, did not increase in size as it should, but the left tube did and as we were quite sure that she was pregnant and I was equally certain that the pregnancy was not in the uterus, and as the tube could be felt growing larger week by week until it was the size of a sausage, anybody could have diagnosed this as a tubal pregnancy before rupture. About that time vaginal laparotomies were in vogue and I was doing a series of them, so I took this woman into the Samaritan Hospital, and as she was exceptionally thin I removed the black sausage-looking tube intact through the vagina. The diagnosis was confirmed by one of our best pathologists. This case was easily diagnosed before rupture, but in about ten other cases the condition was either only suspected or it was stumbled upon while following my rule: "If there is anything in the pelvis which should not be there, the sooner it is removed the better." Following this rule has converted many serious operations into very safe and easy ones. The best man living cannot always diagnose between appendicitis, a pus-tube and a tubal pregnancy before rupture, but if he feels an inflammatory mass in the right side of the pelvis he will make no mistake in removing it at the earliest possible moment. Thus it happened that one of my friends in a large suburb of Montreal was called to a woman with all the symptoms of appendicitis and he advocated operation. But her family would not consent until another doctor was called in consultation. He was more experienced in pelvic work and after careful examination diagnosed a pus-tube. The friends thought that this was a serious difference of opinion, although he too advised immediate operation, and they demanded a specialist in abdominal work. I was chosen by the two doctors and the family, but the only conclusion I could come to was that they were both right; there was a mass as big as an orange in the right fornix pushing

the uterus over to the left; there was tenderness over McBurney's point and she had considerable vomiting. Immediate operation was advised and I was asked to operate, which I did next morning in the presence of some twenty doctors attending the Canadian Medical Association. On opening the abdomen everything was matted together on the right side. After detaching the omentum and several coils of intestine, we came upon a mass of old blood-clot thus adding a tubal pregnancy to the diagnosis, which was afterwards confirmed by the microscope. With great difficulty the ovary and tube were separated from the adhesions and then the appendix was found running into it. The appendix was left in its bed, the cecal end being cut off level with the cecum, according to my usual method of leaving no stump, and the specimen was shown to our society with an appendix five inches long still imbedded an inch and a half in the mass. None of us had diagnosed the tubal pregnancy, but did we make any mistake in doing the operation? I think not. At least ten times I have opened the abdomen for a possible tubal pregnancy and found instead a twisted ovarian cyst with a hemorrhage of a quart of blood in it or a pus-tube; but I was never ashamed of the mistake because there is no other way to save thirty-eight out of forty-one cases. The man who never makes a mistake never makes anything. In every case of pelvic pain let us take a careful history; let us make a careful examination; let us make an exact diagnosis if we can, but do not let us sacrifice the woman's life to our pathological pride. A tubal pregnancy is a malignant disease; its cells have the same power as cancer cells to eat into blood-vessels and cause fatal hemorrhage. Like cancer, it should be removed as soon as suspected: it is almost criminal in either case to wait for a certain diagnosis. In one of his recent papers, Dr. Henry C. Coe, of New York, gave a graphic description of a case of supposed miscarriage which he had been called to curette in a tall apartment-house in New York. The woman who believed herself pregnant was taken with what she thought were miscarriage pains after which she passed some membranes and blood. While Dr. Coe was curetting her, she suddenly went into collapse. From the window he could see the roof of a great hospital in the next street. With great intuition he recognized the mistaken diagnosis and that he had about an hour in which to save her life. He telephoned for the ambulance; within a minute it was dashing around the corner and fifteen minutes later her abdomen was open and the spouting artery tied.

One of my patients sent to me by Dr. G. T. Ross, of Montreal, had an escape almost as narrow. She was a Jewish woman, who had been suffering for some weeks with pains and fainting spells which her family physician attributed to some digestive disturbances connected with pregnancy in which she believed herself to be three months advanced. As she grew worse and worse the family began calling more and more important doctors. The one before the last to be called was an old surgeon with a worldwide reputation, but especially favored locally for his diagnostic acumen. I have often heard him say that there was no excuse for an exploratory incision. But he was not reckoning on tubal pregnancy for here was a woman bleeding to death from an obscure abdominal lesion for which this great abdominal surgeon had no help to offer. The last to be called in when she was unconscious was this friend of mine who is a well-known nose and throat specialist. But he had seen several abdomens opened which were full of blood and he insisted upon the ambulance being called to take her to the Samaritan Hospital. I was in the middle of my second laparotomy that morning when she arrived, and I was urged to make haste, as otherwise there would be no third one. This was done, so that in ten minutes she was on the table getting a hasty scrub up. No anesthetic was needed; in fact there was no pulse and just barely a little breathing. Only enough liquid and clotted blood was scooped out to enable us to find the ruptured tube and remove it and she was hastily closed with through-and-through sutures. The foot of the bed was raised and several quarts of half-strength salt solution were allowed to flow very gradually into the rectum, but she only became conscious next day. She made a good recovery and has had a normal pregnancy since. One of the doctors present was so impressed with this case that he went out and brought in another one whom he had been attending for several days for some obscure pelvic trouble and which proved to be a ruptured tubal pregnancy which nature was trying to wall off. It would be in the interest of humanity if those who are doing these life-saving operations would endeavor to have half a dozen busy general practitioners present at each one, as I am convinced that a great many tubal pregnancies die unsuspected. Otherwise, how can we account for one practitioner meeting with nine cases and another six, while thirty or forty other practitioners in their neighborhood have never even suspected one case among them all?

How easy it may sometimes be to diagnose the condition is evi-

denced by a case to which I was called by one of my students. After one of my lectures on tubal pregnancy this young man came to the professor's room and asked me if I could come around to his lodgings in the next street where he said his landlady was ill in bed with exactly the same symptoms as I had been describing. On making a bimanual examination I found the empty uterus pushed to one side by a painful mass on the other side. She was sure that she was pregnant after ten years of sterility; I was sure the pregnancy was not in the uterus; therefore, it must be in the tube. Operation at the Western Hospital next morning revealed a beautiful tubal pregnancy in a tube surrounded by adhesions due to the gonorrhoea of ten years before.

How difficult the diagnosis may sometimes be can be inferred from the concluding paragraph of Boldt's exhaustive article on the diagnosis of extrauterine gestation, and he has had an enormous experience in this line. He says: "While I have endeavored to outline the conditions which are likely to help in establishing the diagnosis of ectopic pregnancy, as a result of my own experience I freely admit that even the most expert diagnostician cannot be infallible." I heartily indorse this as well as a paragraph from Philander Harris' excellent article, "The failure to always differentiate tubal pregnancy and salpingitis is of little consequence for the reason that the operation is undertaken in the interest of the patient, and while the abdomen is opened the pathology can be removed."

My forty-first case was similar to the one mentioned above by Coe. Dr. Christie called me to curette a woman two months pregnant who took medicine to bring an abortion and who thought she had succeeded, but that the placenta had remained. Before curretting I examined her under anesthesia and found a boggy mass in Douglas' cul-de-sac. Rectal examinations showed the bowel to be empty. I diagnosed tubal pregnancy, sent her to the hospital, and operated an hour later finding a quart of clots and free blood and an ovum as big as a walnut which had eaten half way through a knuckle of small intestines. Tube and intestine were both bleeding freely. A few stitches stopped the bleeding from the intestine and both tubes being diseased were removed. Patient made a good recovery.

The difficulty in diagnosing is greatly increased when an intra- and extrauterine pregnancy coexists. I had only one such case. The woman thought herself pregnant, but was suffering from severe pains in her left side followed by fainting. Dr. Sylvester

examined her and finding a mass in the pelvis sent her to the Samaritan Hospital as a case of tubal pregnancy for operation. I felt the mass, but I also felt the uterus two months pregnant, so I was not sure that it was tubal. But I agreed with him that an operation was necessary, no matter what it was; for if it was a pus-tube and not a tubal gestation, it spelled disaster at or before delivery. It proved, however, to be a tubal pregnancy as well as a uterine one; the former was removed and she miscarried with the other one week later. She had a stormy recovery, but is now well. As a rule, an account of our fatal cases is more interesting and instructive than the successful ones. I had two deaths; one of them is of no interest except that she was a Caughnawaga squaw and that she was sent to me by a full-blooded Iroquois Indian doctor, Dr. Patton, a conscientious physician who never fails to act the moment he suspects some serious pelvic disease. The woman believed herself pregnant, but the uterus was too small for that, but instead there was a large mass in the pelvis pushing it to one side. She was very anemic and I would have waited had I not been almost sure that it was a tubal pregnancy. On opening the abdomen I found about a quart of old and recent blood which nature had walled off very well with coils of intestine and omentum. The tube was bleeding slowly, and was removed. She was making a good recovery when an epidemic of grip struck the hospital which nearly killed the lady superintendent and several of the patients. There were more than a dozen serious cases, but they all recovered except the Indian woman who died on the eleventh day. Up to that time I had had twenty-nine cases without a death and I had begun to think that I would never loose one. Then I had eight more recoveries before I had another death of the thirty-eighth case, and this was a most interesting one. I have already mentioned that Dr. Sylvester had some special aptitude for finding cases of tubal pregnancy, having sent me seven or eight cases besides three others which he sent to other hospitals while I was away in Europe. About two years ago he sent me a case which he believed to be a tubal pregnancy. The woman was forty years of age, married twenty years, but had never been pregnant, and had sent for him on account of a profuse hemorrhage by the vagina. He examined her, decided that it was an extrauterine, and sent her to the Samaritan. I examined her very carefully several times and always felt a solid fibroid uterus in the middle line, but could not feel the ovaries

and tubes as she was very fat. I advised her to remain for a few weeks until she was in better condition for hysterectomy as she was very anemic, but she went home promising to come back when the doctor thought her fit. She improved so much in the next few weeks that she decided not to have any operation and a few weeks later when the doctor examined her he came to the conclusion that both he and I were wrong and that it was an ordinary pregnancy, although I still maintained that although she was pregnant it was in a fibroid uterus. At nine months labor came on and Dr. Sylvester was called; he found her in furious labor, the os open big enough to put his finger in, but he could not feel any part of the child presenting; the pains were unusually severe and he had to keep her relieved with morphin for three days. Then he gave her chloroform and thoroughly explored the uterus which was double its normal size but quite empty. He called me the next morning and repeated the anesthetic and I had now no doubt that it was an abdominal pregnancy and that the child was still alive. She was removed to the Samaritan Hospital and after a brief preparation the abdomen was opened. There was no amniotic sac and the child was floating freely in the fluid which filled the abdominal cavity. It was removed and was soon breathing nicely. But when I started to detach the placenta which was attached to the back of the uterus and broad ligament and to the abdominal wall and to many coils of intestine there was such a gush of blood that it was evident that she would be dead on the table long before the placenta could be removed and I sewed this bleeding spot up again. I then attempted to find and tie the ovarian arteries, but I could not get near them in the broad ligament until first detaching the placenta. So remembering how in my first case the peritoneum managed to take care of the placenta and the child, I thought there was less danger to the woman if I left the placenta alone. I did not drain or leave the incision open, because here was a perfectly aseptic field with an organ, the placenta, which was no longer required, but which was most abundantly nourished so that nature could take her own time to absorb it. Although the baby appeared perfectly healthy, it died suddenly six hours later without any apparent reason. The mother appeared to be doing well except that the vomiting was rather troublesome the first few days; and when it had stopped she could not be induced to swallow anything. She was fed with peptonized milk by the rectum, but gradually weakened and died on the ninth day, with-

out any considerable rise of temperature. This woman's death was due to my delayed operation in spite of Dr. Sylvester's well-founded suspicion that it was a tubal pregnancy. The physical signs were those of a fibroid, but the history was that of a tubal pregnancy. Some one has said when in doubt operate. If I had followed that rule in this as well as in half a dozen chronic cases of appendicitis I believe that there would have been that many more people alive today.

238 BISHOP STREET.

IMMEDIATE VS. DEFERRED OPERATION FOR INTRA- ABDOMINAL HEMORRHAGE DUE TO TUBAL PREGNANCY.*

BY

H. J. BOLDT, M. D.,

New York.

WHETHER an operation for intraperitoneal hemorrhage from ectopic pregnancy should be deferred, or be undertaken immediately, must depend on the judgment of the individual physician, based on his personal experience, and also on a careful study of the experience of others.

I think that we are agreed that physicians do not assign the same degree of seriousness to any particular condition in a specific patient. I shall, then, on this occasion give my own views, based upon personal experience, with a careful consideration of the subject.

Permit me to premise my remarks with a statement of what I mean by a primary hemorrhage from ectopic gestation, and what by a secondary intraperitoneal hemorrhage.

Let us assume that a tubal pregnancy patient shows no noticeable symptoms of the faulty impregnation until suddenly an extensive tubal rupture occurs, which causes complete collapse, evidenced by absence of the pulse at the radial arteries, with the other signs of a sudden and profuse loss of blood. The shock may be so severe as to cause absolute unconsciousness. This is what I call a primary hemorrhage.

Assume another patient with ectopic gestation, who has experienced the symptoms that usually accompany a typical case of tubal abortion, or of partial tubal rupture, with the symptoms of an intraperitoneal hemorrhage. She is not in collapse, how-

*Read at the meeting of the Americal Gynecological Society, Philadelphia May 26-28.

ever, although her pulse may be very small and rapid, and her appearance that of acute anemia. Her mental faculties are perfect, or so nearly so that she may give the physician intelligent answers to his questions. She improves with rest, and after a day or two her general condition will have improved materially. Then another attack comes on, which will cause collapse as the result of the intraperitoneal hemorrhage. The collapse is not, however, caused by the primary hemorrhage, but by the secondary bleeding.

An analysis of the cases in which there was profound collapse from intraperitoneal hemorrhage, but in which nothing in the history pointed to previous intraperitoneal bleeding, shows that by far the greater majority rally from the bleeding sufficiently to come well out of the shock.

To operate upon a patient in profound collapse from a primary hemorrhage is, in my opinion, a mistake; because, with proper treatment, the patient may rally in the course of a few hours. While it is a fact that some patients do not rally sufficiently for us to operate upon them in their improved condition, we may be able to judge of this during the interval from the first sight of the patient to the time when she is prepared for the operation. My own experience has been that in such patients bleeding is renewed within a few days, or even sooner. In waiting for an improvement in the condition of the patient, we must remember that a betterment of the pulse quality also brings increased blood pressure and the danger of renewed intraperitoneal hemorrhage. An operation should not be deferred in patients with active symptoms of partial tubal rupture or tubal abortion. The sooner they are operated upon the better.

Now to the point I desire to make: If the general condition of the patient evidences a slight betterment, we should *not* operate then, but wait until the patient has more fully recuperated, if this seems likely. The fact that the surgeon, assistants, and nurses, with all the other requirements, are in readiness, is no excuse for jeopardizing the chances of the patient by operating too soon; since the added shock of the operation, no matter how rapidly or dexterously done, does lessen the chances of a favorable outcome. It is more rational to wait for three hours or more, until the patient's condition has improved so markedly, judging from the pulse, respiration, condition of the skin, and mental condition, that a rapid operation can be done with comparative safety. It must be insisted upon, however, that all the require-

ments for an *immediate* operation remain in readiness, so that, should renewed bleeding be indicated by increase of the pulse rate, with lessening of its volume, and perhaps other symptoms of renewed sinking, operation may be done at once. The preparations should be such that this can be done within twenty to thirty minutes from the first signs of renewed bleeding. It is of the utmost importance that the intervention should be done in the shortest possible time, not exceeding fifteen minutes in all.

These patients should have a tight bandage put on the upper part of both thighs to act as a tourniquet, transforming their lower extremities into a blood reservoir, and an intravenous infusion should also be begun as soon as they are placed upon the operating table. Strychnine should not be overcrowded; one injection of twenty-five milligrams suffices, and then one or two injections of camphor of 25 centigrams may be used at intervals of two hours.

No time should be lost in looking for the embryo, or in washing out the abdomen. Get out the readily accessible clots and dip the bulk of blood out rapidly with the hand, leaving the rest; pour into the abdomen a pitcherful of saline solution, leaving it to be absorbed with the blood that has been left. In such cases no "fancy work," such as implanting the ovary in the uterine cornu, is permissible. Rush the work without bungling. Such procedure should also be employed when improvement in cases of primary hemorrhage does not take place.

My preference is not to transport such patients to a hospital, but to operate upon them in their homes, because of the increased danger caused by the transportation.

How long shall we postpone the operation if a patient does rally? Not all at, if she has really rallied: when she has a fair pulse, is perfectly intelligent in her answers, and has a normal skin. To wait longer is to assume risks for her, which we have no moral right to do.

Are there cases of intraperitoneal hemorrhage in which operation may be deferred, or may be entirely omitted?

This question can be answered in the affirmative. Let us consider a patient who, from the symptoms and local findings, is the subject of an ectopic gestation. Examination determines the presence of an hematocele of moderate size. Her general condition is good. Active symptoms of progressive abortion or partial tubal rupture have ceased for one or more days. Under such circumstances there is no necessity for immediate

surgical intervention. Such a patient should be placed in an institution where she may be kept under constant, competent observation. Many such cases make an uninterrupted recovery without operation. But such patients should be kept under constant supervision, so that they may be operated on immediately should intraperitoneal bleeding recur, showing that the process of abortion has not terminated.

It is claimed by some that, when bimanual examination shows no tubal enlargement, a complete expulsion of the ovum from the tube can be diagnosed. I consider this improbable in most instances, because of the risk incurred on making an accurate bimanual palpation. Furthermore, even if the ovum has been expelled from the tube, the possibility that bleeding may occur cannot be excluded, owing to the loosening of thrombi from blood-vessels in the tube, especially from traumatism in making the examination.

Should symptoms occur at any time that lead us to believe that intraperitoneal bleeding is renewed, we must no longer delay operation, because with a patient in favorable condition the mortality from operation is very low, perhaps less than five per cent.

39 EAST SIXTY-FIRST STREET.

DR. B. F. BAER read a paper on the same subject which will appear later.

GENERAL DISCUSSION.

DR. AUGUST MARTIN, of Griefswald, Germany, was asked to open the discussion. He said all were agreed as to what should be done in the cases of unruptured tubal pregnancy. One should guard against undue haste in interfering in such cases. When rupture had taken place, however, the case assumed a different complexion, and the circumstances and conditions should be well weighed before one decided to interfere. If rupture occurred and hemorrhage did not stop, one should not hesitate to carry out the well-known surgical principle to interfere to stop the bleeding, thus saving the life of the patient. As to whether a patient should be brought to a hospital for operation in case of ruptured tubal pregnancy, it would depend absolutely on circumstances and conditions. If possible, the patient should be transferred to a hospital in order that she might secure all the benefits which accrue from being in such an institution. He would select the abdominal or vaginal route in the ruptured cases, being guided by the condition of the patient, etc.

DR. SETH C. GORDON, of Portland, Maine, said that in 1886, at a meeting of the British Medical Association, held at Brighton,

he heard Lawson Tait make the statement that "no living man had ever made a diagnosis of extrauterine pregnancy before rupture." Three or four men doubted the statement, but Tait replied, "you may think you have, but I don't believe it." In 1887, on September 24, a pupil of the speaker telegraphed him that he thought he had a case of extrauterine pregnancy and wished him (Dr. Gordon) to come, if necessary, at a moment's notice. Two hours later the speaker received a telegram to the effect that rupture had taken place. "Come at once." Rupture had occurred about twelve hours before he arrived. On opening the abdomen he took out four quarts of clotted blood and a fetus about ten or twelve weeks old. The woman made a good recovery. This was supposed to be the first successful case of extrauterine pregnancy operated on in this country. It was afterwards proved, however, that Johnstone, of Danville, Kentucky, had operated in September, 1886, for a similar condition, and saved the life of his patient. Of the next three cases the speaker had, one came under his observation three months after rupture, one thirteen weeks, and another eight weeks. All of the cases, with two or three exceptions, he had operated on were cases that had ruptured. He recalled only two cases in which he made a diagnosis before hand, without any bleeding whatever, not even from the vagina. He operated at once, and the patients all recovered. In three he operated through the vagina, the rupture having evidently occurred several weeks before, as there was clotted blood found. He opened through the posterior cul-de-sac, washed out the cavity, and the woman recovered. So far he has had no death following one of these operations, and, as a rule, he would wish to be classed among the conservatives who preferred to wait rather than operate in a case of immediate collapse where he was satisfied that the collapse was due to hemorrhage. He could not agree with those who classed shock accompanied with hemorrhage as a different thing and as a plus element in the case. He thought shock was due to hemorrhage. One might have a certain amount of shock due to operation, but what was termed shock in these cases meant in his judgment hemorrhage, as it did nearly always in all surgical operations.

DR. E. W. CUSHING, of Boston, Mass., said it was now twenty years since his attention was called to this subject by a case in a near relative. There were more cases of tubal abortion without manifestation of symptoms than would appear from the discussion. Those who were old enough to have had cases to treat before operation was undertaken would remember many cases of so-called pelvic hematocele which used to go along and get well, and he doubted whether women had tubal pregnancy more frequently to-day than they did at that time. In his immediate vicinity the general profession was now alive to the subject of tubal pregnancy and cases were repeatedly operated on now after the manifestation of the first symptom where there had been apparently hemorrhage due to tubal pregnancy. While he

believed in operating, yet he had seen cases where the symptoms were so slight and obscure, although he believed tubal pregnancy and rupture had occurred, it was difficult to obtain consent to operate. He had had two cases within two months. One of the women was brought into his hospital and was watched constantly for ten days after the first rather obscure symptoms. She had a hemorrhage again, was operated on within fifteen minutes, the blood and tube removed, with a fetus in the end of it. Another similar case was cited.

In cases of severe hemorrhage he called attention to a method recently suggested by Professor Leary, of Boston, namely, to obtain from the heart of a rabbit through a hypodermic needle, without much inconvenience, two ounces of blood from which a serum could be readily made and which, when injected hypodermically, was much more efficacious than any salt solution. This method was particularly advantageous in its effect in cases of hemorrhage from various conditions. He had used this method in one case with gratifying results.

DR. HUNTER ROBB, of Cleveland, Ohio, presented the following summary of his views on the treatment of ruptured ectopic gestation:

"1. More conservatism in the treatment of ectopic pregnancy is called for in the majority of cases.

"2. When the diagnosis of ectopic pregnancy is certain, operative measures are indicated; but in most cases the danger is not sufficiently imminent to warrant immediate interference unless the condition of the patient is otherwise satisfactory.

"3. Many women not only survive the effects of a tubal abortion or rupture, but also recover even without an operation.

"4. Not more than 5 per cent. of the victims of ectopic pregnancy die at the time of rupture, whereas after the immediate operation in cases of ectopic gestation in 1,176 cases in twenty-five clinics the mortality was 8 per cent.

"5. When a patient is seen in a state of collapse, as the result of a ruptured ectopic sac, she should not be operated upon until the condition of shock has been tided over.

"6. These patients, when they die, usually succumb not from loss of blood, but mainly from shock. Why, then, should we superadd to the original shock the additional shock of a major operation, with all the exhausting preliminary procedures?

"7. In support of the view that these patients die from shock and not from loss of blood, we have clinical observations of good authorities and also experiments on animals: the first showing that patients whose abdomens were filled with bloody fluid survived; and the second proving that dogs when exposed to dangers from hemorrhage (sufficiently severe to more than equalize the factor of resistance) do not succumb.

"8. In most of these cases, when we operate to ligate a bleeding vessel, no bleeding vessel is found. In some cases the bleed-

ing is undoubtedly started again by the manipulations of the operator.

"9. What frequently appears to be a continuing hemorrhage may be produced by a welling up of the blood that was poured out when the sac finally escaped through the fimbriated end of the tube.

"10. Some of the reasons why the hemorrhage is not so great as has been generally supposed at the time of rupture are as follows:

"(a) The great majority of ectopic sacs rupture between the first and third weeks of gestation.

"(b) The point at which the impregnation takes place is a small area, formed by a diverticulum in the tube and the chorionic villi have only a feeble attachment.

"(c) Seventy-five to 78 per cent. of the ruptures occur through the fimbriated end of the tube and are tubal abortions, and not more dangerous, so far as hemorrhage is concerned, than those occurring through the cervix.

"(d) The next most frequent place of rupture is the isthmic portion of the tube, which is also free from any large blood-vessels.

"(e) The point of rupture in the gestation sac practically never involves the ovarian or uterine artery.

"(f) As a result of the inflammation which precedes the ectopic gestation, there is a relative increase of the connective tissue in the tube, and owing to the contraction of the connective tissue the vascularity of the tube is limited.

"(g) The placenta is generally attached to the posterior wall of the tube and as the rupture is generally through the anterior or lateral wall of the tube, the placenta is not lacerated, but retains its firm attachment to the wall of the tube and is subjected to pressure.

"11. Physiologists teach that a woman, weighing 130 pounds, must probably lose four pounds of blood before succumbing to the effects of the hemorrhage *per se*. So large an amount of blood is rarely found in the abdominal cavity—the bloody fluid is a mixture of blood and a serous exudate.

"12. The sudden removal of a large quantity of recently accumulated fluid in the abdomen, before the other vessels have had time to adapt themselves to the altered mechanical conditions, is dangerous and may be followed by fatal syncope.

"13. Patients in whose cases the bleeding would be sufficient to cause death are rarely seen in time to be saved by an operation for ligating the bleeding vessel.

"14. Our best operators give a percentage of 40 or 50 per cent. as their death-rate after immediate operations during shock. The deferred operation has given better results in the hands of equally good operators.

"15. So long as there is a reasonable evidence that immediate operation may be the wrong procedure, it is our duty to hold

our hand and leave something to nature. (The medical profession has to a large extent given up the use of dangerous drugs, unless the indications for their use are clear. Should not operators have the same consideration for the lives of their patients?)”

DR. J. WESLEY BOVEE, of Washington, D. C., thought that women rarely lost so much blood from ectopic pregnancy that 5 per cent. of them died from hemorrhage or from the results of hemorrhage. There was no doubt as to the advisability of considering every case of ectopic pregnancy as surgical, but the question was debatable whether in this 5 per cent. operation should be done immediately during shock or deferred until shock had disappeared. Perhaps a large per cent. of the cases would come under that heading, because if allowed to go unoperated they were likely to die from subsequent hemorrhage. He referred to a case he saw a short time ago in which the patient was treated in a tentative manner. There was a total cessation of symptoms, but within ten weeks a recrudescence rendered an operation highly desirable. Operation was done, and a three-months fetus, with membranes, was removed.

From the experience he had had, modified to some extent by his reading, he believed that in every case of ectopic pregnancy the earliest operation that was at all safe should be done, and no case was safe without operation.

As to some of the points mentioned by Dr. Robb, such as the removal of large quantities of fluid before the vessels had become accustomed to it, he did not believe it had a strong basis. In cases in which there was the rapid development of ascites large quantities of fluid were removed without danger to the patient. In gunshot injuries, traumatism of various kinds, in which there was intraperitoneal hemorrhage, the blood was removed without any special symptoms following it.

As to the route, he believed we should always adopt the abdominal. If the case was urgent, the surgical work should be correspondingly rapid. There was no indication in his mind for vaginal section in ectopic pregnancy. A point in favor of early operation in these cases rather than deferred operation was the danger of infection with hematocele from various causes which was greater in the delayed cases than in those operated on promptly.

As to the two ounces of blood which Dr. Cushing spoke of securing from the heart of a rabbit and injecting it into the tissues, this was a small quantity as compared with what we could do with salt solution.

DR. ANDREW F. CURRIER, of New York City, said that, as a rule, as a person got older he became more conservative in regard to surgical procedures, and yet there was scarcely a rule that had not its exceptions, and, it seemed to him, this was one of the rules, and certainly in many cases as he became older in regard to this procedure his views were taking a more radical turn. Those who had seen cases in which procrastination had

been practised, and in which possibly palliative attempts at operation had been made, as, for instance, an attempt made to remove the accumulation of blood through the vagina, will have received such definite impressions in regard to the proper procedure that there will be very little room for doubt. He believed with those who had spoken on the subject preceding him that all these cases were surgical, and just as we would stop bleeding, after a diagnosis had been made of such in any portion of the body, it was equally proper that we should stop a concealed bleeding of the character under discussion. It took a very acute sense to say that bleeding was actually stopped, and if one was satisfied there had been bleeding, he could not see what object there could be in delaying, except in those cases which had been referred to in which the symptoms were mild and in which it was possible to bring the patient under more favorable surroundings. But if hemorrhage had occurred, one ought to determine with positiveness that the case was one which at the earliest possible moment should be treated in a surgical manner.

If operation was deferred, how could one determine when an unfavorable moment might arrive? Who could tell that bleeding might not occur? Who could tell that sepsis and peritonitis might not take place? Once a diagnosis of intraperitoneal hemorrhage had been made, even though one might not be sure whether it was the tube, it was his duty to treat the case surgically at the earliest possible moment by opening the abdomen.

DR. HUGO EHRENFEST, of St. Louis, Mo., said that several statistics had been cited to indorse either deferred or immediate operation after rupture of ectopic pregnancy. These statistics included only those cases that had reached the operating table, but they left out of consideration those cases where the diagnosis was made in the coroner's office, or where the patients were buried with a diagnosis of peritonitis. From what he knew of the coroner's work in St. Louis, he was sure that the diagnosis of ectopic pregnancy was not made very often. These cases were instances in which operation had been deferred, the patients having been treated conservatively. He was inclined to believe that if these cases were included the statistics would possibly change more in favor of immediate operation.

As to the danger of infection if hemocele was permitted to proceed, the remarks of Dr. Bovée reminded him of an interesting case upon which he operated a few weeks ago in which a woman with well-formed hemocele infected herself in trying to perform a criminal abortion. She came under his care with a picture of ectopic pregnancy, which was not quite clear, although there was tumor and septic fever. A diagnosis of infected hemocele was made and confirmed by operation.

DR. F. PFANNENSTIEL, of Kiel, Germany, said that the surgical law must be followed in dealing with the class of cases under discussion, but we would all have some cases which nothing would help. These were the cases in which hemorrhage

came from small openings not larger than the head of a pin, and yet the hemorrhage was profuse. There were rare cases in which hemorrhage was so great that the physician regretted he did not operate more promptly. He thought we should operate as early as possible, but without precipitation. He mentioned one case in which a diagnosis was made of unruptured ectopic pregnancy. The woman was prepared for operation, but a few minutes before she was brought to the operating-table hemorrhage occurred; the abdomen was opened quickly, but death ensued. As one's experience became greater he would have such cases to deal with. But such rare cases ought not to be used as a basis for formulating rules.

DR. BROOKS H. WELLS, of New York, said that in 1887 it was his privilege to be present at a meeting of the American Gynecological Society, and at that session this same subject was before the house for discussion. Dr. Janvrin strongly recommended abdominal section in the treatment of cases of ectopic pregnancy. Before that, only a few abdominal sections had been made, and at the time there was great opposition to Dr. Janvrin's advice. Shortly after, it was his melancholy duty, as an assistant, to sit at the bedside of a young woman and watch her die as a result of internal hemorrhage from a ruptured ectopic pregnancy, and within a short time that experience was repeated. The painful impression of these two cases had been so strong that ever since he had not felt himself justified in refusing to operate on a case of ectopic pregnancy. Out of a large number of cases he had seen eight during the tragic condition, and in some of these there had been a little waiting for a possible improvement of the patient; but he felt that in all cases of ectopic pregnancy—including the 95 per cent. that might get well without immediate operation, and the 5 per cent. of tragic cases that would surely die without it—the best results were obtained by operation performed just as soon as the diagnosis could be made. Since the first paper on the diagnosis of unruptured ectopic pregnancy, by Dr. Baldy in 1890, and with the additional light we now had, there was only moderate excuse for anyone overlooking such a condition and less for mistakes after rupture had occurred. In all ectopic cases the individuals who made the quickest and smoothest convalescence, and who had the fewest symptoms of trouble afterward, were the ones who were operated on most promptly and the mortality in cases operated on quickly was much smaller than in those that had been put in "cold storage" for days or weeks. He could conceive that it might happen to him to have a patient in such a condition that he would not dare operate for fear the shock of the operation would kill the patient; nevertheless, if operation was done quickly, and the operator was skillful, in his own experience these patients did not die from the shock of the operation, but from the loss of blood and neglect and delay, so that he would advocate, excepting in the rarest instances, that operation be done as soon as possible, provided, always that

a competent operator could be obtained. In the absence of a skilled abdominal surgeon, the waiting policy would save more lives.

DR. JOSEPH TABER JOHNSON, of Washington, D. C., said that one was struck with the differences of opinion that had been expressed by the Fellows as well as with the difficulty of attempting to decide why so many doctors disagree.

In going over this matter, as he understood it and had been accustomed to think and read of it during the years of his professional life, he thought it was one of the settled questions. The discussion to-day from his stand-point was likely to do more harm than good. It did not seem to him that we could rely on the results of operations on dogs, as mentioned by Dr. Robb, on the whole. He did not see how one could accept the statements of Dr. Robb as proven, when it was universally admitted that the diagnosis of unruptured and sometimes of ruptured tubal pregnancy was so very difficult. As Dr. Gordon had said, Tait declared it was hardly possible for any living man to diagnose an unruptured tubal pregnancy. He heard him make the same statement, but he thought all were agreed that cases of unruptured tubal pregnancy, and where the diagnosis was clear, should be operated on, and it seemed to him the putting off of those cases in which rupture had already been diagnosed, with the belief that no more hemorrhage would occur, was a dangerous practice and likely to result in more harm than good. He did not see how men, who occupied the side of Dr. Robb in this discussion, could be at all sure when they said they had saved the lives of patients by waiting in cases of ruptured tubal pregnancy, that they had an actual ruptured tubal pregnancy when they had not opened the abdomen to find out. He believed that a great many women would rather perish in the attempt to get well under these formidable circumstances than to have the doctor sit idly by and do nothing, the same as was done years ago in cases of gunshot injury of the abdomen, when a flaxseed-meal poultice was applied, the patient given opium, and slid out of the world as smoothly as possible. It seemed to him to be a backward step to sit idly by with the idea that the woman was not going to bleed any more. No one could say when bleeding was over. If the bleeding were stopped, it would be all right not to do anything, or if one was sure rupture had taken place in the folds of the broad ligament and was going to be confined there. If the hemorrhage could be controlled by compression it would be well to wait. But one could not tell what would happen in these cases to a certainty any more than he could determine what would happen in a case of appendicitis. A woman might bleed to death from a second hemorrhage. Therefore, provided a skilled operator could be had and the surroundings were good, where such emergency surgery was necessary, the sooner a ruptured tube was taken out the better.

DR. WILLIAM GARDNER, of Montreal, said he was present at

the meeting of the British Medical Association, held in 1886, when Tait made the statement that had been referred to. Prior to that time he thought he had treated some of these cases successfully by electricity. But the question of correctness in diagnosis came up. He was sorry that the name of Tait had not received more consideration in connection with this subject because, after all, we were indebted to him for pioneer work in the treatment of this condition. The speaker was not at all certain that a correct diagnosis was made in the case in which he resorted to electricity. At all events, the patient got comparatively well. Some years later, however, the woman had to submit to an operation for the removal of a small lithopedion, proving the diagnosis of ectopic pregnancy was correct, but not settling the question of rupture. He thought all would admit that operation must be done in the majority of cases. The question was, should we wait or operate immediately? He thought Pfannenstiël had sounded the keynote when he said to operate, but without precipitation. He thought the decision of the question would rest very largely with the knowledge and experience of the physician. He confessed himself to be on the side of those who would wait in the case of a very dangerous condition, watching the patient most carefully before deciding to operate.

DR. A. LAPHORN SMITH, of Montreal, said that when he received a copy of the programme it was a shock to him to see the question raised as to whether to operate or not in these cases of ectopic pregnancy, particularly those in which rupture had taken place. There was no doubt in his mind as to the course to pursue as a woman might bleed to death in an hour or two. In other words, the woman was on the precipice, and at any moment rupture might occur. In most of his cases the abdomen was full of blood. It was not quite so important to take out the clots, but one should remember that shock was hemorrhage, and if a woman was in shock it was because the heart was not able to pump blood sufficiently to get her out of that condition. This was a great chance when the heart was quiet for a few minutes, to open the abdomen, stop the source of hemorrhage, fill the cavity with salt solution, and in a few hours she would have a very fine pulse. He regarded tubal pregnancy as a malignant disease, one that was purely surgical with nothing but danger ahead of it, and if one wanted to do his duty in a case of tubal pregnancy he should operate on the woman as soon as he could.

DR. SIMPSON, in closing the discussion on his part, said he thought we should make a distinction between the different operators. Unquestionably, men of wide experience and skillful operators may operate in cases of this affection with a low mortality, but if the teaching went out that operation was immediately necessary, in order to save life, the number of operations would not be limited to experts alone. Many practitioners would feel that just as a strangulated hernia needed immediate

operation, so did ectopic pregnancy, and accordingly they would operate and many patients would die as a result of such work. It was questionable in his mind, admitting that 5 per cent. of the cases would die immediately from hemorrhage, whether the inexperienced operator should be taught to jeopardize the lives of the 95 per cent. in order sometimes to save the lives of the 5 per cent.

With regard to the question of coroner's cases, it could not come into consideration. The mere fact that these cases came to the attention of the coroner indicated that their true condition was not recognized, and no definite plan of treatment was instituted at anytime during the course of their illness.

As regards the necessity for operating, he felt that almost every case of ectopic pregnancy was one that at some time in its existence required operation. He agreed with Dr. Johnson that it was not wise to leave such débris in the abdominal cavity indefinitely.

DR. KRUG, in closing the discussion, said he had nothing to detract and hardly anything to add to his paper as originally read. He, however, took exception to the expression "cold storage." While he might have used it in a private conversation, it was not in his paper. All he could say was that the proof of the pudding was in the eating. His results in former years, when he adhered to the iron-clad rule of operating on all cases at once, were fairly good, but not good enough, and since he had individualized and in some cases temporized a little more his results were better, and of 100 cases or thereabouts, in one service at the Mt. Sinai Hospital, there were only two deaths because of hemorrhage or shock.

PERNICIOUS ANEMIA AND PREGNANCY,*

BY

PALMER FINDLEY, M. D.,

Omaha, Nebr.

Professor of Gynecology, University of Nebraska, Omaha, Nebr.

BUT one paper has been presented to this society on the subject of Pernicious Anemia and Pregnancy. In 1891, Dr. Edwin Davis presented "A Contribution to the Study of Puerperal Pernicious Anemia." In this paper Americans were listed among the early writers on the subject. Special credit is given Channing, of Massachusetts, for his report of seventeen cases, published in the *New England Quarterly Journal of Medicine and Surgery*, No. 2, October, 1842. All of Channing's cases died. In none of them was the anemia in evidence until days or weeks following delivery.

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Davis reported a case which the author states was delivered of a living child that showed no evidence of anemia. The mother passed from a state of threatened pernicious anemia to that of chlorosis under the influence of arsenic, oxygen and food.

In 1854, Lebert reported three cases of pernicious anemia complicating pregnancy, calling these cases of puerperal chlorosis.

Griesinger, director of the medical clinic of Zurich, reported four cases in 1860 and called them "Kachektischer Anæmia." Two of the four cases died in the puerperium. No blood examinations were made, hence the anemia was not certainly pernicious in type.

The most noteworthy contribution on the subject is that of Gusserow, who, in 1871, reported five cases of high-grade anemia complicating pregnancy. He regarded all as pernicious in type. These cases were found in Gusserow's clinic from 1868-70. All died. Their ages ranged from twenty-four to thirty-six. The previous health of all was good. Four were multiparæ. In all the anemia was ushered in during gestation and all aborted in the eighth month of pregnancy. Death followed speedily upon the emptying of the uterus, one before the delivery of the placenta.

The post-mortem findings were uniform. There was a high-grade anemia of all tissues and organs, fatty degeneration of the viscera, serous effusion in serous cavities. The spleen and lymph nodes were not enlarged and in none were the white blood-cells increased in number.

Jaworsky reported a single case of a woman, forty-five years of age, 12-para, previous health good. From the onset of her thirteenth pregnancy she complained of increasing weakness. At the end of the second month she was no longer able to walk. In the thirty-sixth week of gestation, a miscarriage occurred and the child died shortly after delivery. Three days later the mother died.

Sanitor reported a case in the seventh month of gestation that pursued an unusually rapid course. Two weeks before her admission to the clinic she believed herself perfectly sound in health. At the time of admission to the clinic the red cells were reduced to one-sixth their normal number.

I. Clivio (Parma) reported five cases of pernicious anemia complicating pregnancy (*Am. di ost. e gin.*, 1901, Aug.). Three of the pregnancies terminated spontaneously; two were aborted by bougies. One patient died shortly after aborting, the remaining four recovered. The report of blood examinations in these

cases is wanting, hence it is not known with certainty that the anemia was of the pernicious type.

That pregnancy and the puerperium favor the development of pernicious anemia is recognized by authors in general.

Planchard says that, excluding those cases of pernicious anemia arising in the puerperal woman, the disease is more common in men.

There is abundant evidence to substantiate the statement that women are more liable to pernicious anemia during pregnancy and in the puerperium than at other times.

Ahlfeld wrote in his "Lehrbuch der Geburtshülfe," 1894, that he had never as yet seen a case of pernicious anemia complicating pregnancy.

Wagner finds no place for pernicious anemia as a disease peculiar to pregnancy.

In the obstetric clinic of Zurich for 1877-98, there were 8515 pregnancies, and of this number nineteen had pernicious anemia.

Following are the statistics of Myer-Ruegg, of Zurich: 1872-1882—2616 pregnancies—15 cases (0.573 per cent.). 1883-1900—11,784 pregnancies—7 cases (0.573 per cent.).

Eichhorst found in sixty-seven cases of secondary progressive anemia which were examined post mortem that twenty-nine had developed subsequent to childbirth.

It is difficult to account for the apparent effect of pregnancy on the development of pernicious anemia. No satisfactory explanation has yet been made.

Klebs believes chronic puerperal infections may be mistaken for pernicious anemia. It is rare that postpartum hemorrhages precede the development of a progressive anemia. Prolonged lactation may and probably does have some influence.

Multipara are more liable than primipara, and particularly so when one pregnancy has followed quickly upon another. Such conditions as overwork and malnutrition predispose to the disease, though it is observed in many of the reported cases that the mother was apparently in perfect health until in the second half of the period of gestation, when a rapidly progressing anemia set in, the pregnancy interrupted prior to full term and death quickly followed.

The clinical picture as seen in the reports of cases is rather uniform.

In a large per cent. of the reported cases the anemia has first made its appearance in the second semester, and of this number

the majority have been known to have pernicious anemia until near the end of pregnancy or in the puerperium. The onset is usually sharp; beginning with digestive disturbances or loss of blood. As a rule, it has not been possible to fix the time of onset of the anemia. As far back as the anemia can be traced the patient complains of constipation or diarrhea, vertigo, disturbed vision, anorexia, general lassitude, palpitation of heart and ringing in the ears.

We find the mucosæ pale, the skin pale and sallow. At the height of the disease comes apathy, frequently tabetic symptoms with ataxia in the legs, the reflexes lost, the pulse almost always small and running from 90 to 120.

Examination of the blood shows red cells lessened, even to 250,000 or less. There are numerous nucleated reds and the cells are distorted in shape. Macrocytes, microcytes and poikilocytes are present. There is no diminution of hemoglobin. The white cells are not increased in number. The eosinophiles and neutrophiles are lessened, but the lymphocytes are not decreased in number.

The fibrin and blood clacks are diminished.

The postmortem findings are as follows:

Anemia of all organs, fatty degeneration of heart muscle, kidney, liver, stomach, intestine and intima of blood-vessels. Small hemorrhages in kidney, pancreas, brain, liver, pleura, pericardium and spinal cord. Lymph nodes not enlarged; spleen often somewhat enlarged. Bone marrow of ————color.

According to Planhard an absolute diagnosis is based upon the following data:

1. Exclusion of other possible causes.
2. Blood examination.
3. Fatal termination.
4. Postmortem findings.

It is not possible to arrive at a diagnosis in the early stages. Later the blood findings become characteristic.

As to prognosis all fully established cases have terminated fatally.

That there is a higher mortality in pernicious anemia of females than in males is suggested by the statistics taken in Zurich from 1877-98, during which time 79,258 men and 69,012 women died and of this number 200 (0.25 per cent.) men died of pernicious anemia and 396 (0.57 per cent.) women. In the medical clinic of Zurich from 1870-78 there were 6337 males

and 3768 females in the clinic and of this number thirty-three were men and sixty were women.

Occasional periods of improvement are sometimes noted. In the majority of cases pregnancy is prematurely interrupted. Labor usually progresses rapidly with little pain and little loss of blood. As a rule, the placenta follows quickly. The patient weakens, the pulse becomes small and rapid, and death often follows within a few hours. Occasionally life is prolonged for days, weeks and possibly several months.

In the majority of cases the child dies *in utero* shortly before birth. If it lives it shows no signs of the mother's disease.

M. Gräfe advises induction of labor. In the early stage it is not possible to say with certainty that the anemia is pernicious in type, hence at such time the induction of abortion is not justified.

It is worthy of note that Osler takes a more hopeful view of the outcome of pernicious anemia of pregnancy and the puerperium, and advises arsenic in large doses.

The following report is given me by Doctor A. D. Dunn, of Omaha, who was in consultation with me:

REPORT OF CASE.

The patient was referred by Dr. Jones, of Griswold, Iowa, as a pregnancy combined with suspected pernicious anemia. Her age was forty-two years. She had been married ten years and had borne six children. No abortions. No history of excessive loss of blood or infection as the result of previous pregnancies. At the time of her admission to the hospital, May 14, 1907, she was in the thirtieth week of gestation. Early in pregnancy she began to feel weak. She rapidly grew weaker and paler as the pregnancy progressed, but pursued her housework until six weeks before her admission to the hospital. Her appetite was fair and there were no unusual subjective symptoms other than that of weakness. Nothing in the family history having a possible bearing upon the case. Because of the critical condition of the patient only this meager history was obtainable.

Examination by Dr. Dunn, of Omaha, was as follows:

General Appearance.—Patient is a well-developed woman, apparently thirty-five to forty years of age. There appears to be no emaciation. The skin is of a faded, lemon-yellow hue. There are no petechiæ or subcutaneous hemorrhages. Patient is markedly dyspneic, orthopneic and but little cyanotic. Pulse rapid, 110. Blood-pressure, 143 r.r. (5 cm. band). She wanders and is slightly delirious.

The heart is a little enlarged, especially to the right of the sternum. A systolic murmur is to be heard all over the pre-

cordium; it is soft and blowing in character, and loudest in the mitral area. There are no accentuations of any of the sounds, except for some moist râles at the bases of the lungs, there are no pulmonary findings.

Abdomen.—The liver is somewhat enlarged and tender, especially in the epigastrium. On deep inspiration the edge can be felt two to three fingers' depth below the costal arch in the nipple-line; spleen not palpable. There are the findings of between a seven and an eight months' pregnancy. There are no fetal heart-sounds. There is slight retromalleolar and tibial edema. Tenderness over sternum and tibia.

She was admitted to the hospital, May 14, 1907, at 6 P. M. No fetal heart-sounds were heard and no fetal movements were detected. At 7 o'clock on the following morning she was delivered spontaneously and with no pain. While not aware of the birth, she told the nurse that she had soiled the bed, and on inspection the nurse found the dead baby and placenta lying upon the bed. There was very little blood lost. The blood-pressure an hour after delivery dropped from 143 to 88, when she became comatose and died at 8.30 A. M.

The postmortem findings were a large amount of lemon-colored fat in the abdominal wall, the skeletal muscles showed fatty changes, as did the heart, liver, kidneys and uterus. There was atrophy of the stomach and intestinal mucosa and the characteristic bone findings.

Blood Examination of Mother:

Reds,	672,000.
Hemoglobin, 16 Dare 20 Talquist Index	1.2.
Differential nucleated cells.	
Polymorpho-nuclear neutrophiles,	60.
Myelocytes,	11.
Eosinophiles,	0.
Lymphocytes,	15.
Large mononuclear,	1.
Normoblasts,	2.
Magaloblasts,	7.
Mastzellen,	4.

Karyokinetic figures present in reds in considerable numbers.

Polychroma osis and poikilocytosis marked.

Bone marrow shows megaloblastic hematogenesis.

Babe.—A count was made of some fluid blood found in the right ventricle of the infant about three hours after birth:

Reds, 3,720,000.

Hemoglobin, 1.08 Dare.

Polychromatosis, plus.

Poikilocytosis, plus. Nucleated reds in large numbers.

An occasional megaloblast is to be seen.

There were no characteristic findings of pernicious anemia in the babe.

RESUME.

1. Pregnancy and the puerperium exercise a favorable influence upon the development of pernicious anemia.
2. Women are more liable to pernicious anemia during pregnancy and the puerperium than at other times.
3. There is no satisfactory explanation for the effect of pregnancy upon the development of pernicious anemia. Frequent childbearing, prolonged lactation, overwork and malnutrition are predisposing factors.
4. There is a remarkable uniformity in the clinical phenomena and postmortem findings.
5. The onset of anemia is usually in the latter half of pregnancy.
6. The diagnosis is not possible at the onset, but is later determined by exclusion of other possible forms of anemia, by blood examination, fatal termination and finally by postmortem examination.
7. The child usually dies *in utero* or shortly after birth and has never been observed to show pernicious anemia.
8. Spontaneous interruption of pregnancy is the rule.
9. In all well-established cases the disease has proved fatal.

DISCUSSION.

DR. RICHARD C. NORRIS, of Philadelphia, said that this affection was very rare. In his experience of 3000 consecutive deliveries he had seen but one case of pernicious anemia. This woman entered the hospital a few days before delivery, with only 12 per cent. hemoglobin. She fell into spontaneous delivery, and a characteristic of her labor was a disposition of the blood to refuse to clot. She had no hemorrhage, as in the case just reported, but there was considerable oozing from the uterine cavity which persisted, requiring the intrauterine pack and the use of adrenalin for the control of the hemorrhage, but she finally died from this very persistent oozing from the uterine cavity. The autopsy findings were those brought out in the paper.

SUGGESTIONS IN TEACHING GYNECOLOGY, WITH THE DEMONSTRATION OF SPECIAL (MECHANICAL) CHARTS AS AN AID IN THIS WORK.

DR. JOHN A. SAMPSON, of Albany, said that three phases in the study of any of the clinical branches of medicine naturally suggested themselves: *First*, the study of each disease as a science; *i.e.*, its etiology; the changes in anatomy in its different stages and, particularly important, the explanation of its symptomat-

ology. *Second*, the classification of symptoms and the study of the various causes of each symptom and how these causes may be differentiated. *Third*, the art or technic of the clinical branch of medicine, *i.e.*, "history taking," physical examination, diagnosis and treatment; the importance of clinical experience on the part of the student in the dispensaries, wards of hospitals, or in private practice. The conditions caused by each disease, which were illustrated problems, the student should attempt to solve from his knowledge of normal anatomy, normal physiology, etc., instead of memorizing data obtained from lecturers or text-books. In the solution of these problems, questions were asked, and the students' answers corrected when necessary, and supplemented by information which he could not be expected to reason out. Various means might be employed, such as drawings, models, actual specimens, removed at operation or at postmortem, using which-ever means were best adapted to the special subject under consideration. Mechanical charts were of great value in this work.

DISCUSSION.

DR. AUGUST MARTIN, of Griefswald, Germany, said that every means should be employed to aid in teaching diagnosis. The development of feeling power was one of the most essential things for the teacher to impart to medical students. He instructed his pupils to describe what they felt, and some of them had curious ideas. Mechanical charts or preparations of models were great helps. He urged his pupils to make sketches of what they felt.

DR. J. RIDDLE GOFFE, of New York, said that the scheme of gynecology as presented by Dr. Sampson was founded on correct principles. He regarded two principles as fundamental in the teaching of gynecology. *First*, to make students think about having a quiz rather than a didactic lecture, and to keep constantly before their minds a picture, in order that they may develop the habit of pictorial imagination. This was absolutely necessary in making a diagnosis of a condition or conditions in the concealed cavities of the body. One must be able to picture or map out the entire contents of the pelvic cavity and so cultivate the development of that picture as to have a clear mental picture of the abdominal cavity laid open to the psychical eye, as though we had the pelvic cavity laid open to the physical eye. This could be done in two ways: One, as Dr. Sampson had shown, by movable charts, on manikins, and by the use of the blackboard. In the author's experience nothing had been of great assistance to him than a blackboard and a piece of chalk. One could readily outline the normal conditions in the abdominal or pelvic cavity, then he could modify them by pathological conditions, if necessary, thus developing the picture before the student's eye. Touching or feeling was very important, but a man could touch and keep on touching; if he did not utilize his

mind at the same time very little good was accomplished. *Tactus eruditus* did not reside in a man's fingers, but in his brain, and this *tactus eruditus* was aided materially by having a mental picture of the conditions. The student must make a mental picture of what he touches and elaborate what the pelvis will be under normal or abnormal conditions and in this way he became a skilled diagnostician. This not only applied to the abdominal cavity, but to other portions of the body. The reason why the gynecologist was a good diagnostician was because he developed the pictorial imagination together with the *tactus eruditus* in his work. This was the reason why he became a better diagnostician in this particular field than the general surgeon.

DR. FREDERICK H. MAIER, of Philadelphia, by invitation, said he thought they had solved the question of teaching gynecology to students at the Jefferson Medical College in the last two years to their great satisfaction. They could not make gynecologists out of ordinary fourth-year students nor even of post-graduate students, but they could give them a fair idea of the pelvic organs and teach them the ordinary points in diagnosis. With the manikins and charts they had the same trouble. They had made it a practice for the past few years to give all students in the last year, after they had practically mastered the sphere of gynecology, an opportunity, to examine individual cases in sections of twenty-five or thirty, where operations on patients were delayed for half an hour, so that during the course of the year they had an opportunity to examine many cases. These cases were selected. The different conditions were taught them, and in this way they got a very adequate idea of diagnosis which was verified by operation which followed in the second half of the hour, and the mistakes that were made were subsequently corrected. He did not know of any better method of teaching gynecology to students than to have them examine patients *in vivo* and then see the operations immediately afterward, see the mistakes they had made, and see the condition of the parts after the abdomen had been opened. The patients were anesthetized when they were being examined.

HOSPITAL GYNECOLOGY.*

BY

ROBERT L. DICKINSON, M. D.,

Gynecologist to Brooklyn Hospital; Obstetrician-in-Chief to Methodist Episcopal Hospital
Consulting Gynecologist to St. Mary's Hospital, Jamaica.

GYNECOLOGY exists as a specialty—as a well-defined section of the surgical art—because in actual practice the field of the general surgeon is found to be so large that he rarely has time to develop to the full, details of pelvic diagnosis and certain matters of treatment, prophylactic, operative and non-operative; as, for instance, skill in the study of the bladder and ureters, routine

* Read before the American Gynecological Society, May 27, 1908.

use of the proctoscope in cases of obscure pelvic pain, and vaginal attack in lieu of abdominal, wherever it is equally effective. Other things being equal, he is the best man for a particular set of disorders who houses in his cortex the greatest number of expedients and can most deftly develop them at his finger-tips.

But if gynecology is entitled to an individual existence, it will do ill to attempt an isolated existence—a spinster specialism. Our particular work located in a hospital of diversified services must, as compared with a one-line institution, necessarily breed broader men and women, foster consultations with other departments, better the surgery of the gynecologist and the gynecology of the surgeon, and facilitate transfers—must, in other words, cherish the best interests of the patients and render them less likely to be considered mere vehicles for their utero-ovarian organs. Pelvic bigotry and uterolatry are passing, both in meeting-hall and operating amphitheatre. We shall be, first and foremost, all-round medical men, then surgical handicraftsmen and, last of all, experts in one line.

Reason for Separate Service.—In the organization of a hospital, gynecology should exist as a separate department wherever two conditions are met with, namely, a sufficient number of cases of female pelvic disorder to constitute a service and an individual equipped with adequate training in general and abdominal surgery who develops a special aptitude for the relief of the diseases peculiar to women. If divisions in hospital services are multiplied beyond a certain point, the services will not be well attended, for the number of beds allotted to a visiting cannot be such as to make it worth his while to make nearly daily rounds. In small hospitals the need is often well met by the appointment of a consultant who is accorded visiting privileges in his own or in referred cases; but even in institutions of moderate size it may happen that a general surgeon is ill-qualified, either from manner or lack of inclination, to foster and develop such a service.

The question is two-sided, of course. The gynecologist has got to be handy with an unsuspected gall-bladder or any work as far up as the diaphragm, and the general surgeon may not fail to couple his interval appendectomy with the needed cervix repair nor forget to underpin the suspended uterus with a pessary for a first encounter with the wash-tub.

In the interest of women and the institution, the best skill available should be secured. In the Utopian General every visiting will hasten to make way for one better qualified and

every man will recognize his limitations. Our hospital work will never receive the personal attention to daily details and the incessant supervision it demands until men are no longer obliged to subordinate it to earning a living—that is, until they are salaried, then required to attend a given number of hours a day.

Assignment of Cases.—In a hospital where general and gynecological surgery live in peace side by side, the following regulations have been found to work smoothly. It may be noted that this hospital has two hundred beds, and is located where prices are lower than in the borough of Manhattan.

To the gynecological service are to be referred all general admission cases* of women with disorders of the pelvic organs, excepting those directly due to existing pregnancy or caused by delivery or abortion occurring within a fortnight. But "Any patient with a pelvic disorder referred directly to one of the surgical visiting staff or to an associate on the surgical staff shall be credited to his surgical service." Also "Unless in labor, any pregnant patient with a disorder primarily gynecological (*e.g.*, ovarian cyst and ectopic gestation) shall be referred to the gynecological service. A female patient with minor pelvic ailments requiring operation and major conditions calling for general surgery shall be assigned to a surgical service. * * * When in doubt, reference should be to the general service." Diseases of the bladder in women belong to the gynecological department. The disposition of rectal surgical affections in women would be a matter for difference of opinion were it not that such affections rarely exist unaccompanied by other pelvic disorders.

It is a good thing to have ten-dollar-a-week patients classed as private. It makes for the self-respect of women of moderate means, such as school-teachers; it permits members of other services to send in and operate on such cases, thereby adding to the income of the hospital; and it works out practically for the benefit of the surgeon by bringing to him a not inconsiderable tally of the smaller operation fees.

The Visiting Staff.—Passing by theories of perfection, let us consider the actual conditions necessary for reasonable care of gynecological cases in hospitals. Barring curettings, repairs and pelvic inflammations, they are found to be considerable operations. What is the irreducible minimum of rounds to be walked by the visiting? How many days a week? How many hours a day or week?

* Free cases or those paying less than \$10 a week.

This will depend somewhat on feast or famine and upon the way operations group themselves; but in general, the visiting should go complete rounds four or five days a week and the associate the other days, one or the other making examinations within a day of admission and on discharge and inspecting charts and dressings and drains on all patients.

Consultation.—Should there be consultation before every major gynecological operation? Should there be a consultant gynecologist, and in what instances should he be called in? Or will too much delay be entailed thereby? Is a consultant ornamental only? Will conference with and examination by a colleague be more practical and expeditious?

If the visiting is a relatively young man, an active consultant is desirable, and one not too famous and busy and distant. The difficulties of adjusting hours with a man much sought after and the resulting delays are such that the best average consultation is with some surgical side-partner who can be readily captured and who will take an interest in the patient and keep it up. Hospital consultations are so easily obtained and so desirable in the interests of the patient, of diagnosis and of mutual teaching, and for their medico-legal safeguards, that they should be more practised than they are. At present it is often found that they are consistently evaded, even where the regulations call for them.

Associates.—The position of assistant—better labelled associate—visiting gynecologist calls for much tact. While he should speak as one having authority, in his chief's absence, he must not jar the susceptibilities of the honorable the house staff. As between the associate and house officers, the claim of the house officer to the right of gaining clinical knowledge by assisting at operations—in which only one besides the operator sees anything—can be fairly met without detriment to the patient in this way: The associate should be first assistant at important private operations and he may be first assistant in difficult and dangerous free cases. At the beginning of the term of the house officer as senior on gynecological duty the associate acts as first assistant, the house officer as second. As soon as this second assistant shows himself fit to be first assistant, he is to take this position, and the associate only attends by request, though notified of every operation. What operations will be given to the resident will depend entirely on his ability and whether he proves himself to be endowed with surgical sense or not. All that can be given him without detriment to the patient should

given, under supervision, near the end of his term. He has drudged many months in the hope of reaching this shining goal and, though we, who know what his practice will bring, may smile at the small chances of using his experience and at his faulty sense of proportion, we may not deny him his coveted reward.

The ideal conditions exist only in institutions like that of the Mayo's where there is team-work. The same staff, made up of individuals on ample salaries, selected for special fitness for each particular duty, renders dextrous, automatic, interlocking service. The next best *personnel* is developed by appointing a paid resident, who remains one or more years and trains changing crews. The worst method is the usual one, where anesthetist and assistant get their handicraft training at the cost of the patient, and a new outfit is broken in partly or wholly every three months.

House-staff Regulations.—Gynecology presents some peculiar difficulties in the relations between the residents and the hospital patients. For the benefit of the future private patients of the house staff all practicable clinical experience must be given to the residents. In order that intelligent care may be taken of the patients, particularly in emergency and subsequent to operation, the interne must know and see as much as possible. But it is not easy to make house officers comprehend that one great dread in entering a hospital, on the part of any woman, is the fear of exposure or questions or examination or, indeed, any professional contact with new doctors or young doctors; and also that insistence on their clinical privileges to an unwise degree will result in a reputation that will soon cut down any gynecological service. There are certain peasants and others whose feelings do not take offence at careful study. This careful study of history, physical conditions and postoperative behavior may be of great importance to the recovery of any patient. But with the great majority one cannot be too particular concerning exposures and publicity. Wherefore, it is necessary to enforce a regulation usual in the larger hospitals; namely, that in private cases, except in emergency, no vaginal examination is to be made by the house staff without the sanction of the attending. The same holds true of the history of private patients, which is a confidential communication by the patient to her physician and which cannot continue to be so if spread upon the records. The statement of the diagnosis on the history blank is bad enough, many women think.

Gynecological Technic.—For simpler and quicker operations,

with the fewest hitches, for peace with economy and for better training of house staff and nurses a certain *standardization of outfit and procedure* is desirable. This is particularly true where several operators use the same quarters. All ordinary cases readily group themselves within an average requirement and are left to this usual schedule, but departures from the average or standard are readily made to fit the individual case or the individual operator. It is the only plan by which the various persons concerned can be held responsible. The practice of handing down traditions from one house officer to his successor or from one operating-room head nurse to another produces many a hiatus and allows a resident or nurse to interject experimental variations without sanction. Any system, however, presupposes a degree of harmony on the part of the operators and a measure of flexibility in the plan itself. Mutual concessions are requisite to secure a certain uniformity. Variations are not ruled out, but merely reasonably restricted. As an example, if a canvas of the staff results in agreement on a certain small number of needles and of sizes, the instrument-room can be required to keep these always in stock. Again, the omission, after operation, of some simple detail that should not have needed specifying cannot be excused for not having been ordered. Further, if one knows the kit for a given operation, it is easy to modify the list. Here, for example, is the detailed schedule for preparation of patients used by Brooklyn Hospital, of which each of the house staff and every woman's ward should have its copy. Here is a reduced outline of a table prepared for curetting. The nurse has such a sheet of tracing linen for each operation, which sheet, before sterilizing, she must cover with the instruments, to see that each is in place, and which teaches her the order in which they should lie after sterilizing. (See Fig. 1, page 73.)

NURSES' DIRECTIONS IN FULL.

Preparation for Vaginal Operations.

Operating hour is forenoon.

These directions are general. Modification will be made to suit special cases, by the Visiting Surgeon or the House Staff.

(A) Food. (B) Bowels. (C) Bath. (D) Local Cleaning. (E) Quiet.

Food.—Light supper day preceding operation. No food on the morning of the operation. Give black coffee or clear beef tea

early. Give water or carbonated waters, hot or cold, freely for day and evening preceding operation, and, if desired, during night until within one hour of operation, to fill blood-vessels and to prevent thirst. *Exception:* If the operation is to be done in the afternoon, a light breakfast may be given.

Bowels.—The House Surgeon will give orders.

General Bath.—A deep tub bath, ten to fifteen minutes, hot as can be comfortably borne, with scrubbing of abdomen, thighs and genitals, day preceding operation. *Exception:* Omit if patient has had one at home that day, and give in bed if patient is weak.

Local Cleaning.—Shave; scrub; douche; place protective dressing.

Get Ready.—Scissors; safety razor; douche-bag; nozzle; bottle of hot water; bottle of warm bichlorid solution, $\frac{1}{40000}$; green soap; basins; gauze; vulvar pad; towels and rubber sheet.

See that the razor is sharp; that it is freshly wiped with pure carbolic acid and then dried with sterile gauze, not boiled; the water hot, the douche-bag filled, the bed protected, the lighting sufficient. Cover the patient carefully to avoid exposure and chilling. Unless the hair is scanty, clip it moderately short. Make a profuse lather with hot water to soften hair, shave gently and thoroughly; clear the cut hair frequently from a safety razor.

Renew the hot water. Begin the cleaning in the folds between greater and lesser labia, then draw back the prepuce to look for any white secretion beneath it. Let no sponge that touches the anal region make any other contact. Gauze suffices. It scrubs sharply, and is to be changed often. The upper thigh, the buttocks and lower abdomen, are successively scrubbed, dried and covered.

For the vaginal *douche*, see that the solution is warm, and the glass nozzle newly boiled. For the virgin who has never used douches the glass catheter or rubber catheter should be used as a nozzle, in the dorsal posture, with care and with good illumination, to make sure it enters the hymen right. Then hold the greater labia together in order that the fluid may balloon every fold of the vagina, and by its sudden exit flush out all secretions. One quart suffices. Place pad over vulva. If bowels move thereafter wash anal region.

Quiet.—The patient is to be put to bed upon entering. Books and visitors will occupy her mind happily, unless she is exhausted. No hospital tales or gossip.

Just before starting for operating-room, patient must sit up and urinate, unless prostrated; catheter only to be used when ordered. *Exception:* In case of emergency operation, the general bath is to be omitted, unless ordered by the house surgeon, and local cleaning in certain cases is done on operating-table.

Preparation for Abdominal Operation.

Operating hour is forenoon.

(A) Food. (B) Bowels. (C) Bath. (D) Cleaning. (E) Quiet.

Food.—Light supper day preceding operation, unless otherwise ordered by the House Surgeon. No food on the morning of the operation, but give black coffee or clear beef tea early. Give water or carbonated waters, hot or cold, freely for day and evening preceding operation, and, if desired, during night until within one hour of operation, to fill blood-vessels and to prevent thirst. *Exception:* If the operation is to be done in the afternoon, a light breakfast may be given unless otherwise ordered.

Bowels.—The House Surgeon will give orders.

General Bath.—A deep tub bath, ten to fifteen minutes, hot as can be comfortably borne, with scrubbing of abdomen, thighs and genitals, day preceding operation. *Exception:* Omit if patient has had one at home that day, and give in bed if patient is weak.

Local Cleaning.—Shave, scrub, douche, protective dressing.

Get Ready.—Scissors; safety razor; douche-bag; nozzle; bottle of hot water; bottle of warm bichlorid solution, $\frac{1}{4000}$; green soap; gauze; vulvar pad; abdominal binder; towels and rubber sheet.

See that the razor is sharp; that it is freshly wiped with pure carbolic acid and then dried with sterile gauze, not boiled; the water hot, the douche-bag filled, the bed protected, the lighting sufficient. Cover the patient carefully to avoid exposure and chilling. Unless the hair is scanty, clip it moderately short. Make a profuse lather with hot water to soften hair; shave gently and thoroughly; clear the cut hair frequently from a safety razor. Renew the hot water. With a profuse lather, scrub the skin five minutes thoroughly, until reddened. Rinse well before using bichlorid. Dry vigorously, with friction. Apply dry sterile gauze dressing. The patient must not be cold or wet all night.

Quiet.—The patient is to be put to bed on entering. Books and visitors will occupy her mind happily, unless she is exhausted. No hospital tales or gossip.

Just before starting for the operating-room, patient must sit up and urinate, unless prostrated. Catheter only to be used when ordered.

Exception.—In case of emergency laparotomy, omit general bath. Omit enema, unless otherwise ordered; attend to local shaving and cleaning, if ordered; in certain cases it will be done on operating-table.

Relation of Hospital and Dispensary.—Let us harp on the same string always. The interest of the patient, the patient, the patient, first, and last and in between. With it dovetails accurately the interest of the institution and of the visiting and of the house staff. If, at first glance it seems to square least with medical education, yet truly it does so square in any broad and far-sighted view of the matter. Now the best care of a woman is impossible where out-door and in-door treatment woefully fail to interlock, as in most institutions. The patient should come from dispensary to hospital with a provisional diagnosis and any important facts of the history. After operation she must be watched most carefully, returning to the dispensary with her statement of operation and her needs. The form of report to the hospital on admission may be of hospital size for filing with the history, say an admission sheet. The form of report to the dispensary may well be of card size if the dispensary records are card records. In any case intelligent care calls for a report.

The second way in which interdependence may be worked for the good of all is to have the dispensary the natural order of promotion to the hospital. House staff, dispensary, visiting staff, consulting staff—this is the natural progression. If the top man in a department of the dispensary is the lowest man in the same department in the hospital, a properly correlated system is under way. Also the patient is followed into the hospital and out again by the same man. To keep the dispensary up to standard and in touch with the hospital, the visiting should stand ready at stated periods to examine certain cases at the request of the occupant of the dispensary chair.

The gynecological department in the dispensary should be equipped for the diagnosis of diseases of the bladder and rectum in woman and be qualified to treat the simpler cases. For instance, chronic constipation should always be investigated by the medical man in order to locate mechanical causes, for no constipation is cured that is merely fitted with a pill.

Much that has been advocated as to the desirable and practical solution of proper hospital care of women is prevented by:

1. Assumption by an individual of more work than can be faithfully or honestly or even cursorily performed by any one man; and reception by an institution of more patients than it is equipped to treat.

2. A multiplicity of hospitals which are too small to be well outfitted and well manned (where a merger should take place).

3. Defective system. "The American is a splendid organizer, but he does not know how to make his methods simple," said an Englishman lately.

HOSPITAL HISTORIES.*

BY

ROBT. L. DICKINSON, M. D.,

Brooklyn.

Gynecologist to Brooklyn Hospital; Obstetrician-in-Chief to Methodist Episcopal Hospital; Consulting Gynecologist, St. Mary's Hospital, Jamaica.

IN recasting the medical and surgical records of Brooklyn Hospital last year, the forms from a large number of institutions were gathered. As a result of this study of methods made by the surgeon Dr. John E. Jennings, and myself, the following conclusions are submitted:

Simplicity and clearness, ease of reference at bedside or in file or volume, portability and compactness—these practical utilities should govern the plan. For the routine records of the ordinary undermanned hospital an irreducible minimum is to be decided on, a definition of duties drawn up, and then the regulations enforced. On this foundation may be built, later, any research work for which there are brains, men, money, and time. But it must be recognized as such, and there must be eliminated the confusion now existing between the two objects of hospital histories; namely, a record of those facts essential to the care and recovery of the patient and that entirely praiseworthy and altogether different matter—a series of scientific observations. Thus, student and interne should not grow discouraged, and leave, untrained in sense of proportion and perspective, to drop history-keeping in private practice, the while our institutional chronicles vacillate between two extremes—essays and waste paper. It is to be made clear that one paragraph of synopsis of operation entered as the patient is rolled out of the operating-room is

* Presented before the American Gynecological Society, May 26, 1908.

worth pages indicted the second evening after. Convalescences and dressings and condition on dismissal are also matters not to be overlooked.

1. Methods and *sizes standardized* by business usage should be employed. The card-index, the folder and the vertical file are the basis of convenience. While card histories are preferable for private practice because they may be carried to the bedside and the hospital, in institutions sheet records are better than cards. Brooklyn Hospital abandoned cards after ten years' use, and we hear of no hospital that uses them now except in dispensary work.

2. The page should be of one of the standard sizes; that is, one for which the market furnishes stock supplies in the way of filing devices, and not a printer's off-hand suggestion. A convenient proportion is letter size, not to exceed $9\frac{1}{4} \times 11$ inches.

3. Of *printed forms a minimum number* should be allowed. One color suffices for all services. To differentiate services the color of the bedside cards, and a seal to correspond pasted on the folder, classify and identify cases and histories, in conjunction with the proper entry at the head of the history. As an instance of compactness, the New Haven clinical chart may be instanced. Under the temperature-chart stand the entries of urinalysis and blood-tests, while on the back we make those relatively infrequent entries, examination of stomach contents, feces and sputum. B. i. d. and q. 4. h. temperatures go on one chart by dividing the longer day from its neighbor with a red line, and thus preserving our record, in sequence, on one page. The final sheet, ultimately the front sheet of the history, must give at a glance a summary of all important matters, and yet calls for no duplicate entries. Those entries that develop late, such as signatures and the final pathological decision, naturally fall here.

Eight blank forms cover the essential needs of a general hospital, to wit:

(a) Front, or summary; (b) admission history, with two special admission blanks (c) and (d); (c) gynecological history; (d) obstetric history; (e) operation; (f) continued history; (g) temperature-chart; (h) bedside notes. Where a considerable number of histories follow one form, as in obstetrics and gynecology, these are printed in full by the hospital, but blanks for special research are to be paid for by the investigators; they will be of standard size and style, and they will constitute part of the official history, not to be removed from the files.

4. To use *both sides of the paper*, and to do away with heavy clips and holders, the little manila portfolios (called *folders*) used in the vertical file systems to hold letters, hold the history. Clips or snaps or punched holes have not been found necessary. The folder is labeled with the name and the seal of the service, not on the usual free edge, but lengthwise close to and along the back toward the right corner. When filed, the diagnosis goes on the left hand corner. The folders lie bunched at the nurse's desk, and on rounds she carries the light pile from bed to bed, having them in proper order, and handing each at its needed time. As they do not hang at the bedhead, the diagnosis and the operation can be in the history, and the history is confidential (unseen by patient and friends) and complete. If more than one service is represented in a long ward, the nurse has at her table the histories grouped by services (by colored seals). If the histories are to be kept at the bed, I recommend the only light, surgically-clean and concealing holder—a fine new aluminum portfolio. It is all metal, has a spring back that holds one sheet or thirty, is thin, without projections, and bears no enamel to be chipped.*

5. *A patient and his history are never to be separated*, in whole or in part. With the discharge of the patient the history goes to the office (or record-room) to be kept, in its folder, in vertical file drawers under service heading. The office (or record clerk) is responsible. Here the visiting sign, and the historian (or record clerk) enters the diagnosis on the folder, and files under "principal disease," according to the official nomenclature. Here the pathologist makes his late final entry. If the history does not come down with the patient it knocks around a house officer's room until he has a fit of finishing; or if only part comes to the office, some pages may go astray. It is a poor time to locate a missing sheet or to revive the shadow of the memory of an appendix after an interne has had his diploma signed and has disappeared.

Uniformity of nomenclature is essential, whether in indexing the cases in a little hospital or the causes of death of two hemispheres. I have carried this hospital indexing question to the highest authorities in this country. The Census Office and the "Index Medicus" make the same recommendation. Dr. Cressy Wilbur, head of the Bureau of Vital Statistics of the Census, and

* That for letter size history blanks is $12\frac{3}{4} \times 10\frac{3}{4}$ inches, and is known as Sieber & Trussell, St. Louis, No. 675. It costs \$1.60 each in hospital lots, whereas the folders cost part of a cent each.

the librarian-editors in the Surgeon General's Office say the best schedule for our purpose is that embodied in the "Nomenclature of Diseases of the Royal College of Physicians of London,*" which is very complete and in four languages. It includes full lists of injuries, operations, tumors, malformations, etc. An international agreement on nomenclature that will take in, not only the present twenty-nine countries, but Germany and England as well, is hoped for, but this cannot be accomplished before 1911 or 1912. The national societies of specialists, the government departments and the American Public Health Association are expected to collaborate with the American Medical Association in framing a schedule to be submitted at an international meeting planned for Washington in 1910. To bring the system down to practical working size Bellevue Hospital in New York has published a pocket summary entitled "Nomenclature of Diseases and Conditions for Bellevue and Allied Hospitals." This must be followed rigidly in entering diagnoses on histories. It is excellent, and is now under revision after five years of use.

It is a safe statement to make that the above principles and methods halve the cost and double the efficiency of clinical records.

RESPONSIBILITIES CONCERNING HISTORIES.

A working plan is recommended—a one-man responsibility, as follows:

(a) *History Committee*.—A standing committee of one, a member of the professional staff, is answerable to the medical board and to the board of managers or trustees. The committee plans methods, blanks, a surgical syllabus, a medical syllabus and all necessary regulations, and secures their approval by the boards named. He puts these regulations into effect and into type down to minute detail, leaving nothing to tradition. He is assisted by a substitute to provide for absence or illness—say a junior member of the staff. The details of management and the ordering of supplies and filing histories are in the hands of a historian, or history clerk, who should be salaried for this important drudgery in any but a small hospital, even if the visiting staff have to divide up the cost. The name index is kept by the office force. A history from discharge to binding is under lock and key or under supervision in a vertical file in the office—in a place convenient for final entries or signatures.

* Wyman & Sons, Fetter Lane, E. C. London, 1906, 50 cents.

(b) *Visiting Staff*.—However good the method and however eager the interne, without a certain degree of interest on the part of the attending, no histories will be of value. To instruct, to commend good work, in some cases to dictate or make entries, as of operation details, and to look over and sign—these are essential. In case of failure on the part of any visiting to sign histories, the fact is reported to the medical board by the committee. A fixed date is designated for signing, such as the second and fourth week of each month.

(c) *House Staff*.—Here again responsibility begins at the top. The house officer at the head of a staff cannot be allowed to excuse himself for imperfect work on the part of his history-taker. He is answerable. It is for the house surgeon to write up promptly all histories of operations. The heads of the operation should be entered in the operating-room. No man's memory is twenty-four hours long. The lever wherewith to lift the plane of histories is refusal of promotion or postponement of signature to the hospital diploma where a house officer's histories are defective. One enforcement of such a penalty is handed down as a tradition. It suffices.

As a sample of history regulations which leave nothing to tradition or unauthorized alteration—where nothing is taken for granted—the following is submitted. Adaptation to meet special needs can be readily made. The regulations are drawn up to fit the simplified history advocated above, coupled with the Bellevue Hospital method of indexing and filing.

REGULATIONS GOVERNING HISTORIES, BROOKLYN HOSPITAL, 1908.

1. The Trustees require accurate and reasonably complete histories of all patients received into the institution. The Superintendent of the hospital is the representative of the Board of Trustees in enforcing this requirement. The supervision of these records and the arrangement of methods and details is placed by the Board, upon recommendation by the Professional Staff, in charge of the Committee on Histories of the Professional Staff (hereinafter called the Committee). At reasonable intervals the Committee will confer with the Superintendent of the hospital, and, on the matter of the nurses' entries, with the Superintendent of the Training School. The Committee, with the aid of the Historian, gives instruction to the House Staff, sees that the histories are properly kept up and supervises filing and indexing. Requisitions on the office for necessary material for his-

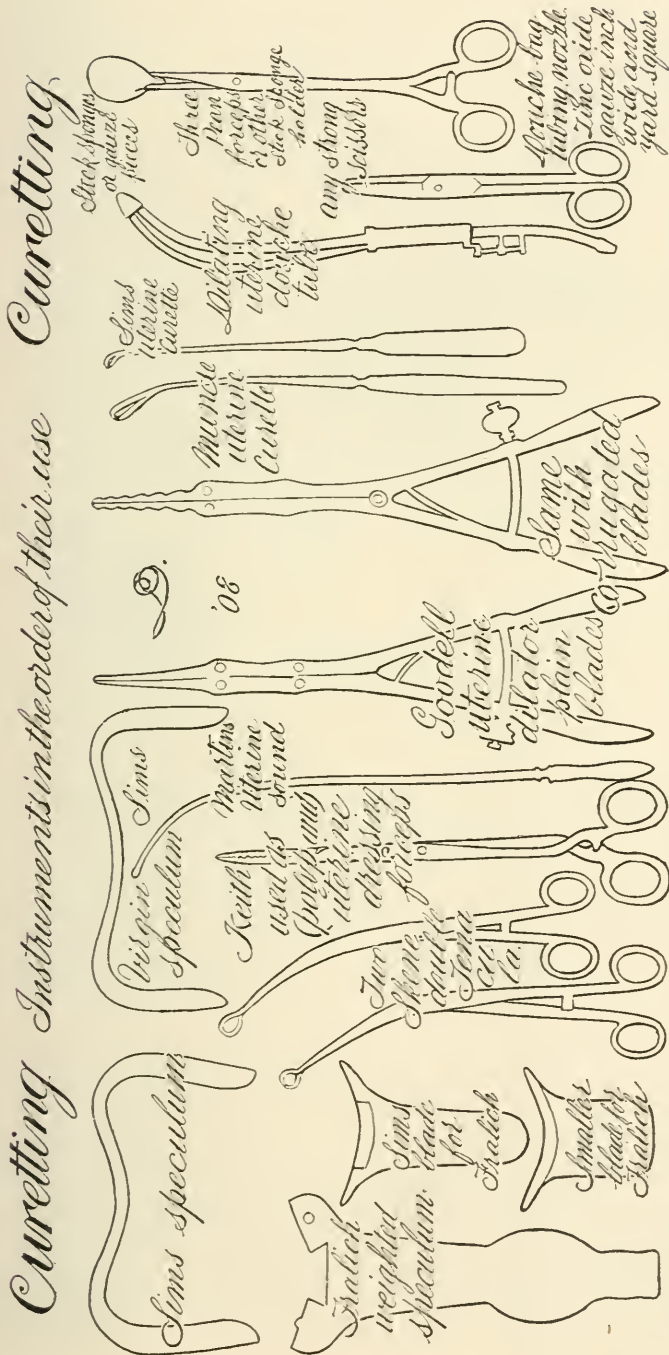


FIG. 1.—Nurse's operation chart, reduced from life-size. On a sheet of tracing linen each instrument is laid and an outline drawn about it, and the name is written across the outline. This insures completeness of outfit and the proper order of placing, and trains in right naming of instruments. Example, curetting.

tories should be signed by the Committee or the Historian. *Without the sanction of the Committee, no alterations in method are to be made.* In the absence of the Committee, the Substitute will act in his stead.

2. The Resident at the head of each service shall be immediately responsible for the histories of that service (except for the chart of the temperature and the bedside notes of the nurses), but he

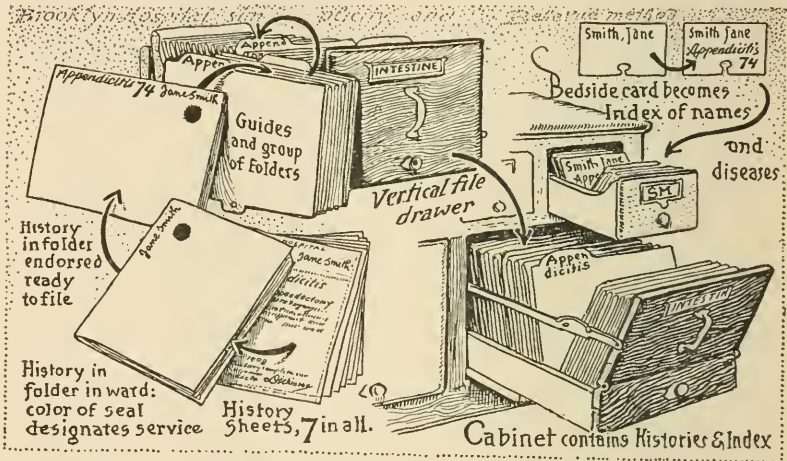


FIG. 2.—Vertical letter-file method' applied to history keeping in hospitals (or offices). A manila folder carries the various sheets of the history. The color of the seal denotes the service to which the patient belongs, and corresponds with the color of the bedside card. The histories are piled, by services, at the nurse's desk, and delivered to each bed during rounds, or else hung by small clips at the head of each bed. After the patient's discharge each is filed by principal disease and serial number thereunder, cross indexing the complications and storing in the drawers until bound. This is the Brooklyn Hospital history and the Bellevue Hospital indexing. The labelling is on this unusual location, because, in filing, the little portfolio is set among others on its open edge, and turns like a big card in a card catalogue. The contents do not spill out. Any completed history between discharge of patient and binding is accessible in sixty seconds.

may delegate to one of his subordinates certain duties or entries after conference with the Committee.

3. Entries are to be made in ink (but sketches or outlines may be in pencil or crayon). Each part of a history (excepting temperature-sheet and bedside notes) must be signed by the writer, but initials will suffice for brief memoranda. Underscoring of headings or important matters is desirable, such as the titles of different operations performed on one patient, the chief complaint, hemorrhage, etc. Due attention to the recording of

Name (written last, and plainly, last name first) <i>Smith, Mrs. Jane.</i>		Ward Admission No. <i>10 4680</i>	Service GYNECOLOGICAL
Residence <i>175 Raymond St.</i>		In charge of (Visiting) Dr. <i>Dickinson</i>	
Age <i>36</i>	Single <input type="checkbox"/> Married <input type="checkbox"/> Widowed <input type="checkbox"/>	Color <i>H.</i>	Nativity <i>Scotland</i>
Occupation <i>Housewife</i>		Religion <i>P. M.</i>	
Admitted <i>May 18th</i>	<i>1908</i>	by Dr. <i>Sahneman</i>	
Discharged <i>June 15th</i>	<i>1908</i>	by Dr. <i>Carey</i>	
Time in Hospital months <i>28</i> days — hours		Transferred to <i>Private Side</i>	See back of card
Received from <i>Carrriage</i>		Referred by (Dr.) <i>Franciscus</i>	Ambulance <input checked="" type="checkbox"/> <input type="checkbox"/> No
Nearest friend or relative <i>John Smith, Sub.</i>		Address and telephone No. <i>3905 Main St. 175 Raymond St.</i>	
Principal disease (according to official nomenclature) <i>Appendicitis</i>			
Complications to be cross-referenced		<i>74</i> ✓	
<i>Salpingitis, Suppurative</i>			✓
<i>Of Moon</i>			
Bedside card; after discharge of patient makes up Name Index. THE BROOKLYN HOSPITAL		Supt	In case of previous admission, transfer, &c., fill in other side.

FIG. 3.

In case of death or transfer, or previous admission, fill in as required.			
Father's name		Father's nativity	
Mother's name		Mother's nativity	
Years in U. S.	Years in N. Y. City	Property	Yes No
Date of death	19... A. M. P. M.	Moribund on admission	Yes No
Certified by Dr.		Coroner's case	Yes No
Transfer, date <i>18 May 08</i>		Transferred without treatment	
Transferred to <i>Private Room 6</i>		by Dr. <i>M. W. Osborn</i>	
Transferred to		by Dr.	
Insubordination	Discharged on own responsibility	Release signed	Yes No
Previous admissions			
Date	Disease and history No.		
Date	Disease, history No.		
Date of order <i>June 1908</i>	No. ordered	<i>1000</i>	

FIG. 4.

FIGS. 3 and 4.—Bedside card; front and back. These are in various colors, so that where more than one service has patients in a ward they may be identified at a distance. According to color, the name of the service is printed in the right upper corner. In a public hospital the pedigree on the back is also filled out on admission. Reduced from 4 x 6 inches. In lieu of color in bedside cards, which is somewhat costly and complicated, a satisfactory designation may be made by a big manila baggage tag bearing a large paper seal of the same color as that on the folder.

conditions and treatment of surgical cases *after* operation and of medical cases during their *later* course and convalescence is required of the House Staff; as, for example, consultation and the result, complications, suppuration on the bedside card, for convenience when used later as in index, the family name comes first, but on the sheets and folders, to bring it close to the upper

FRONT	<p>admission number <u>1680</u> THE BROOKLYN HOSPITAL</p> <p>Service <u>Gynecological</u> Name <u>Mrs. Jane Smith</u></p> <p>FORMER ADMISSIONS DATE. ADDRESS <u>175 Raymond St.,</u> DIAGNOSIS AND SERVICE <u>Brooklyn</u></p> <p><u>May, 1903.</u> ATTENDING, DR. <u>Dickinson</u> <u>Cyphoid Fever</u> ADMITTED <u>May 18th 1908.</u> DISCHARGED <u>June 13th 1908.</u></p>
<p>Diagnosis and Operation</p> <p><u>Appendicitis, gangrenous 74</u> <u>Hifendecomy.</u></p> <p>Complications</p> <p><u>Salpingitis, Suppurative</u> <u>Swelling of uterus</u></p> <p>Condition on Discharge In Full, Signed by Examiner: <u>Recovered, Improved, Unimproved, Died</u></p> <p>14 Jc 08 General condition Excellent Primary union in abdominal wound Very little cautery in peters, uterus fairly mobile. Situs adnaty probe 2 1/2 inches <u>AO</u></p> <p>Requested to Report on at office Referred to R. L. D. till same closes Pathologist's Report, (Signed)</p> <p>Specimen Assay</p> <p><u>Appendix</u> - length 4 inches. distended 3 two places with large coproliths constriction between middle and middle thirds. gangrenous area between middle and upper thirds. <u>Cuticle</u></p> <p>Ultimate Result (and date of entry)</p> <p><u>June 3, 1909 - Peters fairly well cleaned up: some retroversion. feels well.</u> <u>AO</u></p> <p>History Complete, Incomplete Signature of Attending <u>Dickinson</u> Signature of Resident <u>J. H. Cary</u></p> <p style="text-align: center;"><small>Margins reserved for binding and trimming, write inside red lines</small></p>	

FIG. 5.—Reduced fac-simile of front page. This is a summary and contains final diagnosis and pathological report and signatures.

corner the last name of a patient is to be placed last, thus, "John Smith;" and "Miss" or "Mrs." before the Christian name of a female adult.

The provisional diagnosis is to be entered on the admission-sheet when ascertained, and a complete diagnosis is to be filled in on the front sheet as soon as it is known. The diagnosis on the

bedside card will be entered by the house officer who discharges the patient. In the interest of uniformity and good indexing, the official titles of diseases, injuries, malformations and tumors must conform without deviation to the Bellevue Hospital Nomenclature. To determine the heading under which to place

GYNECOLOGY	THE BROOKLYN HOSPITAL
<p>Service <i>Gynecology</i> - Ward <i>6</i> - Room <i>6</i> Name <i>Mrs Jane Smith</i></p> <p>Age <i>36</i> Nationality <i>Scotland</i> P. C. H. <i>Married, Single, Widowed</i></p> <p>Occupation <i>Housewife</i> Race <i>White</i></p> <p>Diagnosis (provisional) <i>Pelvic peritonitis (appendicitis?) or tube</i></p> <p>Complications _____ Attending <i>Dr. Dickenson</i></p> <p>Referred by Dr. <i>Franciscus, 2524 Bush</i> Resident <i>Dr Cary</i></p>	
<p><i>May 18 08 - 9 AM (partly taken May 26)</i></p> <p>Family history, tuberculosis, malignant disease, insanity, syphilis <i>brother 7.13</i></p> <p>Previous health and habits <i>Vigorous two years of occupation typhoid in 13 4 in 1903; good recovery</i></p> <p>Weight loss <i>9 lbs in 6 months, estimated</i> Dyspepsia, cough, palpitation since _____</p> <p>Digestion <i>good till 6 mo ago, vomiting, pain in _____</i> nausea, flatulence, bowels regular, very const. const.</p> <p><i>right side (McBurney's) in 6rd & 8 days "stomach hard", lower 1/2 inflam of bowels"</i></p> <p>Nervous symptoms, sleep <i>poor for a week</i> headache, backache, reflex _____</p> <p>Menstruation began at <i>14</i> years. In early years regular, irregular, painful, leucorrhoea _____</p> <p>Chief complaint <i>a pain in hypogastrium</i> Dates trouble from <i>6 mo</i> Pain began <i>acutely 2 days ago</i></p> <p><i>PAIN dragging, bearing down, aching, cramps, severe, slight, constant, paroxysmal, located in back, lower abdomen, in right or left inguinal region, down right, left thigh. Has increased steadily since 2 days</i> Is present, is increased during menstruation, micturition, defecation, cough, walking, working, standing, before, after, during periods, in moderate degree several months</p> <p>FLOW normal, profuse, scanty, usually, excessive since <i>4 periods</i> No. of menses <i>18</i> in all</p> <p><i>light red, brownish, pink</i> tend, clots, smears, membrane _____</p> <p><i>Regular, irregular, every 26</i> days or weeks. Last period <i>13-16</i> on time, early, late. Character, as usual, scanty, free</p> <p>VACINAL DISCHARGE began <i>4</i> days, months, years ago, whitish, yellow, greenish, white of egg, bloody, maldorant, aged, profuse, slight, constant, before, after periods. Nipples daily <i>1</i> absent. Acute attack, profuse in amount when? <i>4-5 mo. ago</i></p> <p>URINATION, amount increased, diminished, pain slight, severe, bearing down, stinging. Every <i>1 1/2</i> ounces, hours. Times at night <i>3</i></p> <p>trouble began <i>2-3 mo. ago</i> <i>2 or 3 months ago</i></p> <p>AMOUNT OF DISABILITY: confined to bed constantly, during <i>2 days</i> days, dimmed, _____ days each month</p> <p>cannot walk, cannot work much, at all at times, since _____</p> <p>MARRIED <i>4</i> months, years. No. of children <i>2</i> oldest <i>3</i> youngest <i>1 1/2</i> No. of miscarriages <i>0</i> at _____ month last</p> <p>LABORS first, severe, instrumental, operative, stitches, fever. _____</p> <p>Other labor <i>easy</i></p> <p><i>Sent in on ambulance 8:30 AM has had laxative and free action, no menses</i></p> <p><i>General condition good, pulse strong, heart and lungs normal, very anxious.</i></p> <p><i>Abdomen little distended, resistance and some slight rigidity in hypo-gastric region, more definite on right side rectus R. Latou</i></p> <p><i>Splitting r. lower rectus definite. deep resistance: bimanual shows large mass in cul de sac, adherent, firm, uterus showed (poured to R.H. - history suggests appendicitis 6 mo. ago, and Reisser in = splintion more recently. Exploratory lap. advised</i></p> <p style="text-align: center;"><small>Underline words needed, heavily underscoring severer symptoms: date and sig. entries</small></p> <p style="text-align: center;"><small>Margins reserved for binding and trimming: write inside red lines</small></p>	

FIG. 6.—Reduced fac-simile of gynecological admission-sheet. It covers nearly every possible symptom and carefully specifies amount of disability. Outlines of the pelvis and abdomen are stamped or pasted on its back for sketches of tumors and displacements and exudates.

a disease or injury not included in the above, there shall be consulted the "Nomenclature of Diseases of the College of Physicians of London," edition of 1906 (hereafter called the London Nomenclature).

4. The following are the blanks in use, each being designated by the proper title on the upper left corner.

Bedside Card.—The entries on the front of the card as far down as "Principal Disease" will be filled in by the office or admitting officer, and the card sent to the ward at the earliest available opportunity. The diagnosis ("Principal Disease") and complications will be filled in by the house officer who discharges the patient, and these will conform with the like entries on the

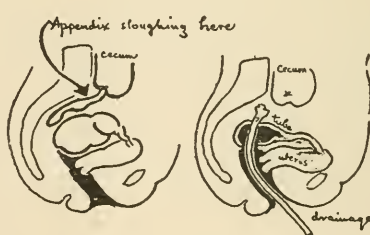
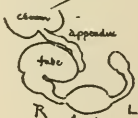
OPERATION	
THE BROOKLYN HOSPITAL	
<p>ANESTHESIA Date <i>May 18th 1905</i> Name <i>Smith Mrs Jane</i> Begun <i>11:45</i> A.M., P.M. Stopped <i>12:25</i> A.M., P.M. Operation begun <i>11:20</i> ended <i>12:20</i> P.M. Duration — hour <i>40</i> minutes Duration — hour <i>35</i> minutes Nitrous Oxide minutes: Ether $\frac{7}{15}$ oz: Chloroform oz: Local: kind, amt. Complications and medication during anesthesia Operator, Dr. <i>Watson</i> <i>Starch Supt 9-1/2 hyp</i> <i>Mucous secretion abundant</i> Anesthetist, Dr. <i>John P. Rosen</i></p>	
<p>OPERATION (Title, for indexing; Full Description; Signature of Operator and House Surgeon)</p> <p><i>1. Appendectomy. Appendix dips into pelvis to right of promontory, in adhesion to uterus, right tibial mass and bowel. distended, with gangrenous spot.</i> <i>2. Drainage of right lum tube through Co-de-Bac. Remove Right Sac Self retaining Drainage Tube.</i> <i>Four incision outer edge right rectus. Not worn picture.</i></p> <p style="text-align: right;"><i>W. H. Cary</i> <i>McClure</i></p> <div style="display: flex; justify-content: space-around;">   </div> <p>Drainage: rubber tubing, II, glass tube, : wicking, pieces. Date Removal <i>May 23 - R. L. D.</i> Pack: number of pieces and material <i>1 3/4 O. Berg</i> Date of Removal <i>May 22nd 18-05 W. H. C.</i> Stitches requiring removal, number, material <i>5 silk white</i> Date of Removal <i>June 2nd 18-05 W. H. C.</i></p> <p style="text-align: center; font-size: small;">Margins reserved for binding and trimming; write inside red lines; date and sign entries.</p>	

FIG. 7.—Fac-simile of operation-sheet, reduced in size. It covers the anesthesia blank, and the drainage blank often used.

front sheet. In case of death these entries will be filled in as soon as practicable by the house officer. In case of death or transfer the proper entries on the back of the card will be made by the house officer. On discharge of the patient, card and history accompany him to the office. The cards will be filed alphabetically by the Record Clerk in the drawers provided for

that purpose. The history number will be added by the Historian (or Record Clerk) when filing the histories by disease.

Front.—This is to be filled out by members of the House Staff (or Visiting Staff) when the facts called for are developed, but does not take its proper position until the history reaches the

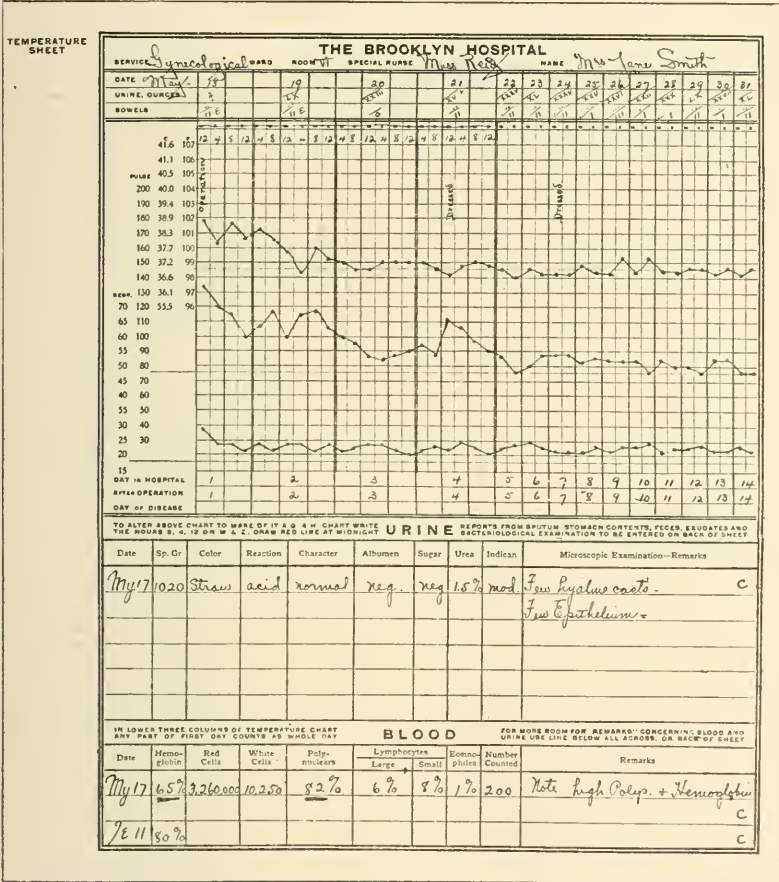


FIG. 8.—Temperature-sheet, reduced in size: to make a q. 4. h. chart from this, the hours 4, 8, 12, are placed at the top of the column and a red line drawn for midnight.

office. In dismissing accident cases, a full statement of the conditions on final examination is required, over the signature of the member of the Visiting Staff or House Staff making such examination. The back of the sheet is to be used where the front does not furnish sufficient space under any given heading.

5. Admission History.—Histories on the Medical Service shall

be taken on the lines of the syllabus provided. General surgical histories shall follow the order of the surgical syllabus. Gynecological admission histories of any service shall be entered on the special form *Gynecology*. Obstetric histories shall be taken on the blanks provided therefor. The history on admission shall be filled out, in the folder, within twenty-four hours of admission,

BEDSIDE NOTES		THE BROOKLYN HOSPITAL											
HEAD NURSE		Mrs. H. Sobu											
ROOM		to Room 6											
NAME		Mrs. Jane Smith											
DAY OF MONTH	HR	MEDICINE				FOOD/DIET		REMARKS					
18	9												W. mucous, 250. Prepare abdomen for medicine operation
	9:15												At 10:00 Dr. G. J. ...
	11:30												Returned at 12:30 pm
	4												Returned at 11:00 am
	11:45												Returned at 12:30 pm
19	9-10												Returned at 12:30 pm
	1:30												Returned at 12:30 pm
	7:30												Returned at 12:30 pm
	8:30												Returned at 12:30 pm
20	4												Returned at 12:30 pm
	1:30												Returned at 12:30 pm
21	6												Returned at 12:30 pm
	5												Returned at 12:30 pm
	1:30												Returned at 12:30 pm
22	9												Returned at 12:30 pm
	4:30												Returned at 12:30 pm
	2												Returned at 12:30 pm
23	6												Returned at 12:30 pm
	8:45												Returned at 12:30 pm
	1:30												Returned at 12:30 pm

Fig. 9.—Bedside notes of nurses, compacted as much as possible.

whenever possible. Outlines whereon injuries or tumors or the like may be plotted may be pasted on the back of this sheet.

6. In private gynecological and genito-urinary cases in which the history has been already taken by a member of the Visiting Staff, only the general items at the top of the history-on-admission, such as address, age, sex, etc., should be entered, but the following note shall be made on the record: "Private case;

history taken by Dr.....” In other private cases the history will be taken unless otherwise directed by the Visiting. A private case, although in charge of a member of the Visiting Staff connected with a different service, shall be entered on the history-blank of the service to which the case properly belongs. Thus, a breast amputation, whoever the operator, is classed as general surgery, and any private obstetric patient is classed as of the Obstetric Service and the history is entered on the appropriate blank.

7. *Exceptions.*—Surgery of the pelvis and eye, ear, nose or throat or orthopedic cases which are referred by the surgical staff of the First and Second Surgical Services should be entered as general surgery and histories kept accordingly, but the gynecological admission history may be used for female pelvic cases.

HISTORY CONTINUED		
<small>READ WITH TITLE PAGE OF THE BOOKS</small>	THE BROOKLYN HOSPITAL	
	<i>Name</i>	

FIG. 10.—Heading of continued-history sheet.

In filing, care will be observed to index these properly. In order to favor a more equitable division of surgical work between the two House Surgeons, all general and special surgery sent in by members of the Visiting Staff not belonging to the First and Gynecological Services shall go to the Second Surgical Service.

8. Endeavor shall be made by the interne filling out the admission history, to ascertain the name of the physician who has referred the patient to the hospital or to the service of a member of the Professional Staff (except in private room cases), or who sent for the ambulance, or that of the family physician, and such name shall be entered on the history. In case of a common name (*e.g.*, Dr. Smith), initials or address should be added.

9. *Temperature-sheet* (see also under Nurses' Directions).—The entries under "Urine" and "Blood" will be made at the earliest convenient time by the Pathologist. Whenever more space is needed by the pathologist, the back of the temperature-sheet

may be used, with a reference note on the front; but important final reports, as of sections and autopsy, belong on the front page. Reports on sputum, stomach contents, feces and bacteriological returns will be made on the back of the temperature-sheet.

10. *Operation.*—The folder carrying the history shall accompany the patient into the operating-room and return to the ward or room as soon as possible after the patient's return. The House Surgeon or Acting House Surgeon shall make entry, or cause entry to be made (in the operating-room as soon as possible after each operation or examination) of a synopsis of the operation or findings, or both together, with the name of the operator and a memorandum of drains or packs or stitches to be removed, and shall append his signature. If the most important facts are

HISTORY ADMISSION	THE BROOKLYN HOSPITAL			
	<i>Service</i> _____	<i>Ward</i> _____	<i>Room</i> _____	<i>Name</i> _____
	<i>Age</i> _____	<i>Nationality</i> _____	<i>P C H.</i> _____	<i>Married, Single, Widowed</i> _____
	<i>Occupation</i> _____		<i>Race</i> _____	
	<i>Diagnosis (provisional)</i> _____			
	<i>Complications</i> _____		<i>Attending</i> _____	
	<i>Referred by Dr</i> _____		<i>Resident</i> _____	

FIG. 11.—Heading of admission sheet for medical and surgical cases.

entered, gaps may be left for filling in details later. The record of anesthesia made by or under supervision of the anesthetist is to be entered directly on the operation blank soon after the operation.

11. *Continued History.*—Here all important matters in the patient's condition after admission or operation which are not covered in other blanks shall be summarized always and, where necessary, related in full. Such items as important changes in conditions or suppuration must be entered at once, but a synopsis of the nurse's bedside notes may be required not oftener than once a week. The house surgeon and house physician will be held responsible for a continued history that gives, in a brief form, all important events.

12. Care must be exercised that the diagnosis on the front sheet is full and exact. On dismissal of all except obstetric patients, the history accompanies the patient to the office, and is filed in the history case under service headings or guides until

signed by the visiting. The pages are then placed in the following order: Front; Admission History (or Gynecology); Operation, if any; Continued History; Temperature-chart; Bedside Notes. Any missing form must be reported to the Committee or Historian at once by the office. Any late report from the Pathol-

Methodist Episcopal Hospital.					
Brooklyn, New York.					
OBSTETRIC CASE RECORD			Hospital No.	Service No.	
Service of Drs.	Age		Name		
In Charge of Dr.	S. M. W.		Date of Admission		
Sent in by	Occupation	Nationality			
	White, colored	P. C. H.	Para		
Summary of Case					
Abnormal Features					
Family History: Tuberculosis, insanity					
Previous History: B'achitis, scarlatina, diphtheria, disease of the kidneys, disease of the heart, tuberculosis, malarial fever, insanity, operations					
Pelvic History. Menses began at yr. Regular, irregular, every days, with, without pain; amount normal, scanty, excessive, leucorrhoea free, slight, acute, began when? Cystitis					
Pelvic diseases and operations, with dates					
Married		months	years	Miscarriages, number	month last
Previous Pregnancies: vomiting, headaches, edema, convulsions					
Previous Labors: easy, difficult, operative				hemorrhages,	stitches; fever
Children born alive, dead				last previous labor	
Present Pregnancy: vomiting, headache, edema, varicosities					
Last menstruation began		Quickening		bowels regular, costive	
				Confinement due	
EXAMINATION ON ADMISSION			Before Labor, In	Stage of Labor.	
General Condition			heart	lungs	
Circulation			varicosities	edema,	
Breasts, nipples well formed, prominent, flat, retracted, creviced					
Abdominal wall firm, pendulous, fat			tension	struc oew, old	
Uterus Height of fundus above symphysis			contractions	Liquor amni excessive, not excessive	
Child's Back to mother's front, back, left, right: child's head, location					
Child's Heart, Location			Rate	Movements present, absent	
Presentation:			above, in, below brim	Position	
Pelvis: Sp. I.	Cr. I.	Et. coaj.	Diag. coaj.	Estimated internal coaj.	
Other Measurements					
Genitals: Perineum intact, laceration			Varices		
Vagina, secretions			laceration		roomy, small
Cervix, position			os externum admits		fingers, os internum admits
Uranalysis					

FIG. 12.—Obstetric sheet, reduced from 10¼ x 11¼ inches. Only the essentials are admitted.

ogist will be entered on the front sheet, in the office. The visiting staff will sign histories here also.

13. The second and fourth weeks of the month are "signature weeks," and any member of the Visiting Staff will find, in the history case in the office, the histories grouped under his name or his service, and will sign the same. Inasmuch as good histo-

ries are only to be obtained by personal attention of the head of each service, in case of failure to inspect and sign histories on the part of a member of the Visiting Staff, the Committee will call the member's attention to the omission and, on expiration of a reasonable time, report such omission to the Professional Staff.

14. No history or part of a history nor any part of the index may be taken from the building except by written order from the Superintendent or the representative of the Superintendent. Such order shall be filed in a place indicated by the Superintendent. Access to the histories after completion shall be had only by the Superintendent's office, the Visiting Staff, the Historian, the House Staff and the Dispensary Staff. Histories shall be kept in folders in vertical files in the office until bound.

15. Supplies will be kept in the store-room, but small quantities will be on hand in the wards or in the rooms of the House Staff in convenient places designated by the Committee. Special printed forms will be furnished by the hospital whenever a large number of histories cover the same limited field, as in the obstetrical and Gynecological Services, but the cost of special blanks to collect observations for researches by members of the staff must be met by the member making such research. Such histories or portions of histories shall constitute part of the hospital record, and may not be removed.

16. The index of names will be kept in the office by the office force except as above specified. An index of operations will be kept by the Historian, conforming to that in the London Nomenclature. On the "Complication sheet" and the "Cross-reference sheet" the Historian shall record each complication and disease as the Committee shall direct. The histories will be bound as they are filed in the order of the Bellevue Nomenclature—that is, by diseases.

The Committee on Histories of the Professional Staff for the current year is Dr. Dickinson; Substitute, Dr. Jennings; Historian, Dr. Pier; Associate Historian, Dr. Moore.

NURSES' DIRECTIONS CONCERNING HISTORIES.

The outside cover of a history is called a folder. The upright cardboard bearing label of service is called a guide. Entries will be made in ink. The last name of a patient is to be written last, thus "John Smith," and Miss or Mrs. precedes Christian name.

The folders containing histories shall be grouped together in a suitable place in the wards and on the Private Side. Each folder is to contain, in this order, the following blanks: Temperature Chart; Bedside Notes, in regular sequence, turning over like pages in a book; Front; History-Admission (or Gynecology); Operation (if any); Continued History.

The History blanks are to be assembled in proper sequence by the nurse in charge on admission of the patient to the ward or room. The admission number is to be entered on the history by the nurse in charge. The admission slip bearing the admission number and the patient's name and designating the service will hang at the patient's bed until the bedside card replaces it.

The following are the blanks in use. Each is designated by a name in its left upper corner:

Front.—This is filled out by members of the Attending Staff or House Staff when any of the facts called for are developed, but is not put in its position until the patient is discharged.

History Admission.—The plain History blank is used for all cases but obstetrical and gynecological, when the special blanks for such histories are to be substituted; all entries are made by the Staff.

Operation.—Anesthetist and House Surgeon make the entries.

Temperature Chart.—To convert the b. i. d. temp. into a q. 4. h. temperature write, covering or just below "M" or "E," the hour, thus, "4, 8, 12, 4, 8, 12." This permits unbroken records, when a change is made from one method to the other. A red line is drawn after midnight of each day whenever the q. 4. h. method is employed. One day at a time is usually enough to fill out. All temperatures are to be b. i. d. unless otherwise ordered, excepting that major operations shall have q. 4. h. temperatures for four days after operation.

Under the heading "Day in Hospital" designate any part of a day as the first day. Under the heading "Day of Disease" designate any part of a day as the first day. "Day after Operation," designate the day of the operation as first day.

Bedside Notes.—Admission temperature is to be entered. No lines should be wasted. The bedside notes and the chart of temperature are the province of the nurse, and entries should not be made by others.

Continued History.—For a synopsis of the after-care or for memoranda by Visiting Staff or House Staff.

The history accompanies the patient to the office on dismissal.

DISCUSSION.

DR. I. S. STONE, of Washington, read a paper on

CYSTOCELE.*

DR. F. PFANNENSTIEL, of Kiel, Germany, said that in the treatment of prolapse of the uterus and bladder the most important point was the cystocele. The best way to prevent the recurrence of a cystocele was, in his opinion, the vaginal interposition of the uterus between the bladder and the vagina. Neither ventrofixation nor any method of shortening the round ligaments gave good lasting results, because the relaxed pelvic floor could not hold the bladder in the normal position. On the contrary, the bladder was pushed downward by a ventral or inguinal fastening of the uterus so strongly that the best methods of colporrhaphy would not be sufficient to hold it up. With the recurrence of the cystocele began the recurrence of the prolapse and retroflexion. The only measure that could help here was the interposition of the uterus between the vagina and the bladder, and that was a vaginal operation consisting in a combination of very extensive vaginofixation with corresponding anterior and posterior colporrhaphy and perineoplasty.

For this purpose he laid stress upon a complete separation of the bladder from the cervix and vagina, not only in the middle, but also laterally, in order to be able to push it upward as far as possible. Furthermore, the uterus should be sewed to the vagina not at the fundus, but in the upper third of the anterior surface of the corpus. The elliptical flap cut out of the anterior vaginal wall should not be too broad, and the vagina slightly undermined on both sides in order to make ample room for the interposition of the uterus. While the vagina was sewed up the cervix was pushed back into the posterior fornix, since if drawn before the vulva in this step of the operation, later it would not readily return into its proper position high up. Interrupted sutures were employed, and the last one tied was used as a tenaculum. A corresponding colpoperineorrhaphy completed the operation by providing for the descended uterus a new firm support. This operation could be performed also on a woman still within the childbearing age without any danger of causing a dystocia. Then, however, the following modification had to be made: it was necessary to interpose the peritoneum of the bladder as we had been taught by Dührssen. The permanent results of the modified operation were not so entirely satisfactory. Recurrence was possible, and, therefore, he preferred the method of fastening the uterus to the wound surface of the undermined vagina.

* Will appear in a subsequent number of this Journal.

The subject was further discussed by DRs . J. RIDDLE GOFFE, of New York; AUGUST MARTIN, of Griefswald, Germany, and CHARLES P. NOBLE, of Philadelphia.

DR. HUGO EHRENFEST, read a paper entitled

ENDOMETRITIS EXFOLIATIVA.*

SECOND REPORT ON OPERATIONS FOR RELIEF
OF PELVIC DISEASES OF INSANE WOMEN,
INCLUDING 411 PATIENTS.†

A STUDY OF THE CHARACTER OF OPERATIONS APPEARING TO
GIVE THE BEST RESULTS, ALSO THE CHARACTER OF
INSANITY RECEIVING THE GREATEST BENEFIT.

BY

LEROY BROUN, M. D.,

Surgeon to the Woman's Hospital, Consulting Surgeon Manhattan State Hospital
New York.

"MERE medical and moral treatment does not meet all the requirements of psychiatric practice, and therefore we should leave no stone unturned in endeavoring to treat our cases individually according to their several needs."

Such are the words of Mabon, the former president of the New York State Lunacy Commission and now the Medical Superintendent of the Manhattan State Hospital.

In other words, each patient should be restored to the highest state of physical health in order that the special treatment directed to her mental state shall be productive of the greatest good.

It was in this spirit and with this desire that in 1902 I was placed in charge of the gynecological operations of the Manhattan State Hospital, an asylum having under its care some 2500 women and receiving yearly about 1000 new patients.

All patients on admission are given a systematic physical examination, including the condition of the abdominal and pelvic organs, each feature of the examination being carried out by one trained in the special line.

When pelvic or abdominal pathological conditions are present such patients are referred to me for the purpose of determining whether symptoms arise from such, and if so whether an operation will be of benefit.

The advisability of an operation having been decided on, the guardians of such patients are communicated with, the condition and physical benefits explained and their approval of the

* Will appear in a subsequent number of this Journal.

† Read at the meeting of the American Gynecological Society, Philadelphia, May 26-28 1908.

operation considered advisable is asked. When refused, as not infrequently, nothing is done.

It will be seen that the physical condition and the possible relief from the resulting physical distress have alone been considered. The mental condition has not been taken into account except in instances in which the psychical state precludes the advisability of any operative procedure. The patient, after she has recovered from the operation, is transferred from the hospital ward proper to the one to which she had been previously assigned; there the treatment directed to her mental state is again taken up.

A separate history has been kept of all patients operated on in order to determine if possible to what extent the relief from physical symptoms, together with the asylum treatment, has benefited their mental condition.

Since my connection with the hospital there have been done by myself and under my supervision 411 abdominal and pelvic operations.

What benefit, if any, have these operations been from a mental standpoint? Has the effect been in any way to hasten the patient's mental recovery? or has their mental condition shown a more rapid improvement after the operations than before them? With patients in whom, from the character of their psychosis, there is no possibility of a mental improvement, have they been made more contented with their surroundings and happier units of the colony of which they are a part? These are the questions that are vital to us and which can only be answered by a study of the progress of many patients upon whom operations have been performed for the relief of physical suffering. A few isolated cases prove nothing. There are too many associated factors entering into the progress or lack of progress of a patient mentally deranged to argue from small numbers. To succeed in offsetting one set of extraneous conditions by others of an opposite character, a collective study of the results of many operations is necessary; by this means only can we with reasonable surety feel that we arrive at correct conclusions.

In 1905, I presented for your consideration a paper entitled "Operations for Relief of Pelvis Diseases of Insane Women," based on the surgical work performed on these unfortunates during the two years previous. The conclusions drawn at that time from a study of the effects of these operations were:

1. That in no instance was the mental disturbance of the patients accentuated by the operations performed.

2. That the physical benefit shown by those operated on was noticeable in a marked degree in almost 50 per cent. of the cases, and appreciable in about 40 per cent. As a result of this bodily improvement they became happier and more contented units of the colony among which they lived.

The mental recovery of twenty of those included in this preliminary report was unquestionably hastened by the operation performed upon them. While in most instances there had been some mental improvement before the operation, yet in all of the twenty the psychic improvement was striking after the surgical recovery, and in some instances the improvement seemed to date from the operation.

At the time of presenting the paper from which the above conclusions were drawn I did not feel justified in making further deductions other than that the apparent mental improvement, as a result of the operations, did not depend on the character of the operation done, but more upon the relief from the train of symptoms attendant upon the pathological states for a cure of which an operation was demanded.

Three years have passed since the preliminary report of this work. The number of patients included in the present report is 411. This includes the total number operated on for the last five years.

Of this number seventy-two patients have been discharged as recovered.

The mental recovery of thirty-two, or about 44 per cent., showed a much more rapid improvement after the operation than before. No patient is included in this number whose mental progress was not strikingly marked after the operation in comparison with her progress before the operation was done.

For the purpose of studying the character of surgical work done on those whose mental recovery was in a large measure due to the relief given, I have divided the operations into two classes, abdominal and plastic.

Among the abdominal operations occur twelve recoveries.

Three followed supravaginal hysterectomies for fibromyoma of the uterus, both adnexa being removed in each instance. Seven followed suspension of the uterus, in two of which the adnexa of one side were removed. In one gastroplication was also done. In two small fibromyoma were also removed. One

followed removal of an ovarian cyst. One followed Bassini's operation for inguinal hernia.

Among the plastic operations, twenty recoveries occur, including operations for endometritis, for lacerated cervix and perineum and for displaced uteri.

From the above it would not appear that the mental benefit resulting could be ascribed to any especial class of surgical procedure. Among the abdominal operations the largest number of those benefited were patients with adherent displaced uteri. In none of these were both adnexa removed. In two of these patients one adnexum was removed.

Among the total number of abdominal sections it was necessary to remove both adnexa in thirty-seven patients. In only three of these was there any apparent marked mental improvement following the operation. This result is not in accord with the published results of some operators. These operators appear to attach considerable importance to diseased ovaries and their removal, even though slightly cystic, in order to attain the greatest good with their insane patients, the apparent idea being that a certain reflex irritation was set up by the presence of ovaries that were diseased, even to so slight a state as cystic degeneration.

Such teaching is diametrically opposed to the accepted fact that the interests of the patient's nervous system are best conserved by preserving when possible even a part of an ovary, and certainly not sacrifice ovaries healthy or cystic. The monographs of Kelly, Doran, Burekhard, Andrews, Nicholson and the exhaustive study of Peterson as given in a recent paper, strongly emphasizes the accepted importance of conserving the ovaries when possible to do so. The removal of these organs, when not destroyed by disease, can only result in the development of a train of symptoms directly opposed to a favorable outcome in the treatment of insane women.

Raimann, in 1903, in an excellent article, reports in full eleven cases in which the hallucinations were referable to the pelvic organs. These patients were selected from the local asylums and referred to Professor Schauta's clinic, they were chiefly cases of hysterio-epilepsy, hysteria and delusional insanity.

In all the adnexa were removed, though not necessarily diseased. In only three was there any improvement.

The results of my own work are more in accord with that reported by Manton, who for a quarter of a century has been

connected with the East Michigan Hospital and has probably done more than any one else to educate asylum superintendents in the importance of relieving the physical distress of those under their care.

Picqué, of Paris, surgeon to the alien hospitals of the department of the Seine, also in the reports of his work gives results in accord with those of my own. The largest number of patients benefited mentally were among those with whom some form of plastic operation was done, demanded by bad cervical tears, pelvic-floor lacerations and protrusions, and, when present, displaced uteri. Two-thirds, or twenty, of those benefited belonged to this group. The number of patients needing minor operations were, however, considerably in the majority of those on whom abdominal sections were performed.

It is a common occurrence for all of us to see a pleasing physical and nervous improvement follow a restoration of a badly-torn cervix and perineum or a return of a uterus to its forward position. It is but reasonable that the same relief of symptoms should follow the same operations on the insane and at times hasten the beneficial effect of the special treatment addressed to their mental state, provided the character of insanity is such as can be classed as recoverable.

CHARACTER OF MENTAL DISTURBANCE MOST BENEFITED.

Of the thirty-two patients whose mental recoveries were hastened by the operations, twenty-five, or 78 per cent., were in cases in which the insanity showed the dominating symptom of *depression*. In the old classification existing in the hospital prior to 1904, these were grouped under melancholia, acute and chronic, involution melancholia and depressive hallucinosis.

In the new classification now adopted the majority of such conditions are placed under one head, manic-depressive insanity, and others to the involution period of life. Five of the remainder, or 15 per cent., were patients in an excited or exalted mental state. The remaining two patients were with a diagnosis of dementia præcox and paranoic symptoms.

IMPORTANCE OF EARLY OPERATIONS AND TREATMENT.

Fifty-eight per cent. of the number of patients who received hospital treatment and operations within six months after the commencement of their insanity were improved or recovered; thirty-three per cent. of those receiving treatment and operations

within a year improved or recovered. These do not include those in the first class. Twenty-six per cent. of those receiving treatment and operations after the expiration of a year were improved or recovered.

The number of recoveries taking place among those with whom treatment was commenced within six months after the commencement of the mental disturbances was five times as great as among those when treatment was commenced at a later date.

This fact of the importance of early treatment is recognized by all alienists and is a prominent factor in the prognosis of the probable recovery of one coming under their care. The outlook for an amelioration or favorable termination of recoverable cases is greater when submitted to treatment before the psychosis becomes a fixed habit. After the expiration of a year the possibility of bettering the patient by any form of treatment rapidly diminishes.

Forty-four per cent. of the seventy-two who were discharged recovered had their improvement hastened by the operations performed. Why it is that some recover and others with a like mental disturbance, even under the most advanced treatment, fail to respond, can only be answered by citing a parallel with physical diseases. The ability to improve varies with each individual, whether mental or physical. Tomlinson, of the St. Peter's Hospital, Minnesota, aptly expresses this varying response to the stimulus of treatment in the term "individual nervous potentiality."

The view at present accepted by most writers on insanity and by those in charge of large bodies of insane, is that pelvic and abdominal diseases in women act (by the distress following such) as coincident or secondary causes in the production of insanity in women of an already weakened mentality.

Such conditions, however, only act in undermining by a slow, continued process the general health of the subject, eventually culminating in the complete break-down of the patient already predisposed. Again, such diseases can be the cause of a patient already insane becoming wildly maniacal or deeply depressed. As an example of such conditions I cite two cases:

Miss D. McL., age thirty-four, single, was admitted to the hospital May 14, 1903, in a greatly excited state, almost constantly screaming and crying out. She had been insane for three years, the mental diagnosis being delusional insanity. When I saw the patient two days following her admission the

abdomen was tense and distended, little could be made out except a rigidity of the muscles of the right side. The leukocyte count was 23,000. An operation was immediately done and an appendicular abscess was evacuated and drained. All hallucinations disappeared after the operation, and she was discharged five months later apparently recovered. This patient was readmitted a year later with hallucinations, though of a milder character.

Again, Miss C. S., admitted to the hospital December 23, 1902, with a diagnosis of dementia præcox. The depressive type of her insanity was very marked. The patient would not answer when spoken to nor would she speak to any one. When first seen by myself, two years after admission, she refused to eat, necessitating tube feeding. The emaciation was marked. The pelvic condition was the exudative remains of an old perimetritic abscess ineffectually draining itself through a vaginal sinus. Cultures gave an almost pure streptococcus.

A panhysterectomy was done. During the surgical recovery of this patient the rapid change in her mental state was most pleasing. She not only answered questions intelligently, but would speak to members of the staff, calling them by name. From one deeply depressed she became light-hearted and showed a lively interest in all her surroundings. She was discharged in the hopes that she could continue without asylum treatment. Family differences precipitated an acute exacerbation, necessitating her return to the hospital. A large ventral hernia resulting from drainage in the first operation was repaired. A few months later, her mental condition being so mild, she was discharged in a condition to assume some of the duties of life. She has not returned to the hospital at this writing.

The above cases are examples of septic intoxication coming on after the establishment of a psychosis and greatly accentuating the mental disturbance. The surgical relief was of benefit in relieving acute mental exacerbation.

As an example of acute mania following an operation for a pelvic abscess and resulting in recovery after a cure of the sepsis, I cite the following: Mrs. R. H., age twenty-two, married, entered Roosevelt Hospital for a tubo-ovarian abscess. This was incised and drained by the vagina. Shortly after the operation the patient became acutely maniacal. Upon admission to the State Hospital, November 14, 1904, there was an extensive exudation in the pelvis with abscess of the other tube and

ovary. Under repeated incision and drainage, the exudate cleared up. The patient was actively maniacal throughout her surgical treatment. After the pelvic exudate had disappeared she slowly improved and was discharged recovered May 8, 1905, five months after admission. She has remained in sound mental condition.

Insanity following operations is fortunately rare; yet there are few of us, with average surgical experience, who have not had some such occurrence.

In the large majority of cases it is due to a septic intoxication as in the above instance. The Manhattan State Hospital, receiving the insane of New York City, is the recipient of all such cases occurring in the general hospitals. They are, fortunately, few and in every instance since my connection with the institution such conditions have followed sepsis. Rohé, in a communication with all the insane hospitals of the United States and Canada, states that in the ten years prior to 1903 only twenty-five patients had been registered as having become insane following gynecological operations. Martin sates that no woman, unless of a marked neuropathic state and hereditary predisposition to insanity, can become insane as a result of an operation. Picqué, whose large experience with the aliens of Paris entitles him to speak from experience, states that the large percentage of such conditions follows sepsis and occurs in alcoholics; when insanity does occur under conditions other than the above, he states that in his experience it is with those who are weak-minded and who have an abnormal fear of operations. The number of cases reported by Thomas, Edwards, Gray and others of twenty years ago was when surgical asepsis was not what it is today.

In the light of modern knowledge, insanity following surgical operations is rare. The character of the operation is not a factor, such occurrences being as likely to follow a trivial general surgical procedure as one of a graver nature. The determining cause is a neuropathic state associated with an hereditary predisposition and an exaggerated fear of the operation.

Among the patients whose recoveries were hastened by operations the following cases will serve as examples:

Mrs. T. M., age thirty, married, was admitted to the hospital November 19, 1902. The mental condition was one of acute mania. The pelvic examination gave a bad laceration of the cervix and perineum with an endometritis. The conditions

were repaired March 5, 1903. *Four months* prior to the operation, the patient showed no mental improvement under the regular hospital treatment. After the operation she made rapid improvement under the same treatment and was discharged recovered June 20, 1903, two and a half months after operation.

Mrs. H. L., married, age twenty-one was admitted to the hospital February 23, 1903, with a history of having been insane for two days. Her general physical condition was poor. The mental diagnosis was melancholia acuta. The pelvic condition was a retroverted adherent uterus with adnexal disease. The patient did not respond to the hospital treatment, showing no mental improvement after *five months*. August 4, 1903, the adhesions were severed and an intraabdominal shortening of the round ligaments was done, also the right ovary and tube were removed. The patient made a rapid physical and mental improvement and was discharged September 4, 1903, one month after operation. It would appear in this instance as if the depressed state was directly due to the pelvic condition, on account of the rapid mental restoration and the failure of the patient to respond before the relief of the pelvic condition.

The following is an example of the benefit of an operation not gynecological:

Mrs. H. W., age forty-three, married, was admitted to the hospital August 24, 1901, with a history of having been insane for one month. The mental diagnosis was melancholia acuta. When seen a year after entrance she had a large right inguinal hernia. Bassini's operation was done November 20, 1902, *fifteen months* after admission. During this interval of fifteen months her hallucinations had been persistent. Four months after the operation all hallucinations had disappeared and the patient was discharged recovered.

There are other examples among those whose mental recovery was hastened by the operations in which the beneficial effect of the surgery was as striking as with these patients above cited and others in which the improvement was more gradual. A further narration of these cases will, however, unnecessarily lengthen this article.

The large percentage of those benefited belonged, as stated, to the manic-depressive group, a recoverable class susceptible to the benefit of all forms of physical improvement. It is possible that all of these patients might have recovered independent of the operation; it is, however, none the less true that their

recovery was hastened by the operations. We may attribute this to the moral effect or the physical improvement. The results, however, remain the same. I personally consider the physical benefit of the greater influence, and am not inclined to attach much importance to the moral side. One characteristic of this group of insanity is their proneness to recurrence after having recovered from one attack. While alienists state that this is especially true of this group, it is also true of other forms, though probably not to such an extent. There has been no return to the hospital of any of the patients included in this article other than those mentioned.

A striking feature of pelvic and abdominal conditions among the insane is the almost uniform denial of any resulting symptoms on the part of the patient. When questioned she will in the majority of instances stoutly deny that there is any thing wrong or that she has any pain or distress.

As gynecologists, we must depend on our knowledge of such conditions and not give too much weight to the denials of the patient.

The presentation of this subject would be incomplete without a discussion of the character of insanity likely to be benefited through the indirect agency of surgical measures. As I am not trained in this line, I can only state the abstract results obtained as an operator, and as such have laid them before you.

In order to present to you what forms of insanity are most likely to be benefited I have requested my friend, Dr. Mabon, the medical superintendent of the Manhattan State Hospital, to give me an expression of his opinion upon this subject. He has kindly done so in the following:

“Replying to your letter of the 20th ultimo, I beg to say that the following diagnoses were made in the seventy-two cases* in which it is thought that recovery was hastened or assisted by operative treatment:

Mania acute	11
Melancholia acute	21
Melancholia chronic	8
Manic-depressive, and allied	7
Mania recurrent	1
Puerperal mania	1
Delusional mania	2

*Dr. Mabon includes here all cases “recovered” or “improved” by the surgical operation. I have selected only those “recovered” which were thirty-two.

Alcoholic psychoses	6
Infective exhaustive psychoses	2
Depressive hallucinoses	5
Depressions not differentiated	3
Dementia præcox	3
Primary dementia	2

The terms used above represent the old and the new forms of classification, the older forms being used on account of patients having been at the institution before the new forms came into general use, and all cases designated as "mania" or "melancholia" can be placed in the manic-depressive group, which aggregates fifty-one, or about 70 per cent.

Six cases, or 8 per cent., belong to the alcoholic psychoses, while it is astonishing to us that only two cases, 2.7 per cent., have been drawn from the infective exhaustive group.

The depressive hallucinoses furnished five cases, or about 7 per cent.

You ask in what form of insanity the surgeon may benefit the patients. I think alienists would consider, in the first place, that small group of disorders in which operation aims to reach directly the exciting cause; namely, the psychoses with operable brain tumors, traumatic lesions of the skull, acute hallucinosis with middle-ear or mastoid disease, the deliria in connection with local infections and perhaps some of the psychoses accompanying thyroidism.

Owing to the evident complexity of the etiology which exists, even in the best circumscribed symptomatic groups, it is clear that in the general estimation of the value of surgical interference, it must be regarded as a procedure ranking with our other therapeutic measures which aim to get the patient as quickly as possible into a condition of bodily comfort and physical vigor.

Manic-depressive insanity is regarded rather as a disorder arising on a constitutional basis and expressing itself in one or more attacks liable to be elicited by a great variety of causes, among which states of physical ill health are very important. In cases where the surgeon can relieve the condition which is wearing on the patient, causing worry, pain or loss of sleep, good results may be expected to follow, and sometimes recurrence of attacks prevented. (Italics by writer of paper.)

In the alcoholic group, the psychoses often develop in connection with some physical disease, especially infectious dis-

orders, and a special mention has been made by Kraepelin, Mott and others of infections in the genital tract, particularly in women, as an important element in causing the outbreak and continuance of the psychosis.

In the infective exhaustive group good results can be expected wherever foci of infection can be attacked and removed, or where any exhausting influence can be checked. (Italics by writer of paper.)

In the large group of dementia præcox, little in the way of permanent improvement can be expected, as it is here probably that certain deeply-rooted inherent traits are working with various mental causes to bring about a gradual disintegration of the personality.

I have tried in this to be as brief as possible and beg to say that in the analysis of these cases I have been assisted by Dr. Hutchinson and Dr. George H. Kirby. The views as expressed represent pretty generally the opinion of alienists."

Dr. Mabon's opinion as an alienist coincides with the facts brought out in this series of cases, namely, that aside from the small group of traumatic insanity with which as specialists we are not likely to be concerned, it is reasonable to expect that a beneficial mental result will follow surgical operations upon patients with the manic depression form of insanity, in so far as the operation improves the physical health of the patient. The same improvement can also be expected in exhaustive psychosis, either as the result of hemorrhage or sepsis. We know definitely that such operations when they do not involve an unnecessary castration cannot accentuate in any manner the mental state of the patient.

With this knowledge, how important it at once becomes that any woman on becoming insane should be given a thorough physical examination and that all pathological conditions should be rectified at once in order to restore to her at the earliest possible moment a full quota of bodily health, that further treatment can be effective, knowing that the possibility of a recovery diminishes rapidly in the direct ratio of the length of time of the existence of the alienation.

If the combined efforts of the alienist and the surgeon should fail, they still have the satisfaction of knowing that the unfortunate patient has been placed in a condition free from bodily discomfort and that we have given to her the same privilege granted when needed to the sister who has been more fortunate.

DISCUSSION.

DR. WALTER P. MANTON, of Detroit, Mich., said that about twenty years ago he began this special work. He was one of the first to take up systematic work among insane women. He wrote and read a number of papers before asylum superintendents. At first he met with opposition, but gradually, as the result of a continued agitation, the superintendents of asylums began to wake up believing there was something in this, and now there was hardly any institution in the United States which had not some gynecologist or special member of the staff appointed for gynecological work. This had been a favorite subject with the profession, and the general practitioner was always active in securing results by operative measures. He saw years ago that insanity was not to be cured by operation *per se*; that the results were obtained not from the operation alone, but from the general treatment of the system, and that the operation was only one factor in removing the source of irritation which gave a better chance of effecting a mental cure. Many cases were apparently cured soon after the operation, but the majority of them sooner or later had a relapse.

He recalled an interesting case quite recently in the Eastern Michigan Asylum of a young girl twenty-three years of age, who had obsessions during her menstrual period. She was brought in to undergo some operation. She had suffered all her life from dysmenorrhea; there was backward displacement of the uterus, with an ovarian cyst on the left side. Immediately following the operation the patient regained her mentality and remained well for a number of months. Her menstrual periods were free from pain. She was so well that the authorities thought they would let her go home. The members of her family, who live in the country, were house cleaning at the time and the girl, feeling perfectly well, assisted them, overworked herself, with the result that she returned to the hospital in a worse condition than when she first entered it. Had this girl been kept in the hospital for a number of months longer, although she had a bad heredity and was neurotic, he believed she would have been entirely cured of her condition. As it was, she was improving rapidly, and under proper conditions would probably ultimately be cured, and if she was kept in the proper condition she would remain cured.

He recalled the instance of a servant girl who became insane as the result of chronic constipation, or autointoxication. She was apparently cured; started to go home, was half a mile from the institution and before she reached the asylum gate she broke down and had been in the institution ever since. It was found afterward that she had become constipated again and had not been relieved.

DR. ROBERT L. DICKINSON, of Brooklyn, N. Y., said there was one phase of the subject that had not been touched on, and that

was the treatment of bad cases of nymphomania by ovariectomy. He recalled three cases on which he had operated for this condition, with three cures. The reason for the lack of success in previous operations was that they had not been radical enough. Undoubtedly, some fragment of ovarian tissue had been left behind, and whether the various plexuses had kept up the local irritation he did not know, but radical operations on these three cases resulted in three successes. It was now two years since the operation had been performed on one, five years on the other, and seven on the other, which went to show that the previous failures were probably due to lack of thoroughness.

SYMPOSIUM: INTRAPELVIC (SUBPUBIC) VS. ABDOMINAL METHOD
OF DEALING WITH MECHANICAL OBSTRUCTION TO
DELIVERY IN CASES OF CONFINEMENT.

INTRAPELVIC (SUBPUBIC) vs. ABDOMINAL METHOD
OF DEALING WITH MECHANICAL OBSTRUCTION
TO DELIVERY IN CASES OF CONFINEMENT.*

BY

RICHARD C. NORRIS.

Philadelphia, Pa.

THE important teaching of the modern results of the surgery of obstetrics is that of every surgical triumph, namely, an early elective operation performed by an expert surgeon with proper environment on a patient with good resistance. The pregnant uterus is not an exception to this rule. With this fact in mind, it seems appropriate at the outset of the discussion before us to sharply draw anew the indications for the absolute indication of Cesarean section for mechanically obstructed labor. While it is true that pelvic measurements alone cannot wholly suffice for this study, and it is equally true that uterine energy, the shape as well as the size of the pelvis, the size of the fetal head, the condition of the cervix and of the pelvic floor, are all factors to be studied and to influence our judgment, it is also true that, from the view-point of the *absolute indication*, no one factor is more important and none can be ascertained with so great a degree of scientific accuracy as the direct measurement of the true conjugate of the pelvic inlet. The measurement of this diameter progressively loses its importance in studying the pelvis that may be grouped among the relative indication, but for the absolute indication is it not time, in view of the modern results of Cesarean section, to formulate a general rule, to which there will be

*Read before the American Gynecological Society at Philadelphia, May 26-28, 1908.

few exceptions, that when the conjugata vera is less than $7\frac{1}{2}$ cm. in the simple flat and 8 cm. in the generally contracted pelvis, Cesarian section at or before the onset of labor should be the elective operation? The merits of pubiotomy as an alternative operation are to be determined by future observation and study.

This, then, is the first proposition I would offer for your discussion. Can the conjugate vera alone, and shall a measurement of $7\frac{1}{2}$ –8 cm. or less, determine the absolute indication for elective section? Careful study of labor obstructed by pelvic deformity has brought me to the conviction that only exceptional circumstances would induce me to employ any other elective treatment for that degree of pelvic obstruction to labor.

That no other treatment is justifiable implies the necessity for careful study of patients before the onset of labor.

In order to avoid confusion, we must bear in mind throughout our discussion to-day, that elective or predetermined treatment of obstructed labor shall constantly be contrasted with forced or necessary treatment due to unfavorable conditions and neglected opportunity. At the very outset, then, it is necessary to emphasize the demand of modern obstetrics that the successful management of primiparæ and of multiparæ with histories of difficult labors requires that they shall, prior to labor, receive skilled examinations and study. This proposition must be accepted by the profession as the first step in any advance that the obstetric leaders can offer. The only reasonable argument of those who would minimize preliminary study is that of the so-called "test of labor," which, especially, is to be applied to the minor degrees of obstruction that include the relative indication for Cesarian section. Reynold's studies have demonstrated, as reliably as statistics can determine this question, the progressively increasing mortality of the section after varying degrees of tested labor. On the other hand, the statistics of spontaneous labor occurring in the degrees of obstruction now under discussion, gathered from various sources, show an average of 70 per cent. of unassisted labors and a total infantile mortality of about 11 per cent. Statistical arguments are commonly fallacious, but in this instance they are sufficiently convincing to teach us three important facts:

First, that too frequent selection of the section for moderate obstruction is not justified. Second, that preliminary study is essential to differentiate, with ever increasing precision, the cases that may safely be left to nature, or be aided *at the appropriate*

time by skilled subpubic assistance. Third, that a test labor, when permitted, shall be so conducted that this progressive mortality and morbidity after any operative interference shall by some means be reduced. My belief is that this mortality, which is greatest after the late section, is largely due to infra-pubic sepsis, and its reduction will depend upon a rigid aseptic management of such labors and upon operative interference being resorted to before exhaustion of the patient, which usually can be prevented by early and complete dilatation of the cervix and vagina in order to shorten the duration of labor and to conserve the patient's strength and surgical resistance.

The obstetric expert recognizes as equally necessary and difficult the following study, four weeks before term and at intervals thereafter, of all primiparæ and of multiparæ with histories of difficult labors:

(a) The relative size of the fetal head to the pelvis.

(b) The size and shape of the pelvis, their relation to each other, and the modified effect of these relations upon the mechanism of labor.

(c) The condition of the soft parts comprising the lower birth-canal as related to the probable duration and traumatism of labor.

(d) The character of the patient; *i.e.*, her probable uterine, nervous and muscular energy. In other words, her personal equipment for the ordeal of labor.

This field of study is to-day the most important because the most difficult of all obstetric problems. Here lies opportunity for the formulation of new and the development of old ideas; for the constructive ability that can devise new instruments of precision and for the unprejudiced analysis of the world's work that we may improve our obstetric judgment as well as our operative skill.

(a) *The Relative Size of the Fetal Head to the Pelvis.*—The methods of determining the relative size of the fetal head to the pelvis, unfortunately, are less accurate during pregnancy than during labor. At the examination made two to four weeks before term, the head in many primiparæ will be found deep in the pelvic cavity, showing no relative disproportion, and such cases require no further study from the view-point of pelvic obstruction. When the head is freely movable above the pelvic brim its relative size should be estimated. Perret has devised a special instrument for measuring directly through the abdominal wall

the occipito-frontal diameter and he estimates the biparietal diameter as 2 cm. less than that measurement. Stone uses an ordinary pelvimeter and subtracts 2 cm. from the occipito-frontal measurement when it is 11 cm. or less; 2.5 cm. when it is over 11 cm. I must confess that these methods have not proven sufficiently accurate in my trials of them to gain my confidence in their results. Pinard's table, made from measurements of a large number of fetal heads, shows the average biparietal diameter to be $8\frac{1}{4}$ cm. at the thirty-sixth week of gestation, 9 cm. at the fortieth week. This table can conveniently be carried in mind as a standard, but has value only when the duration of pregnancy is accurately known and the induction of labor is contemplated. These methods, however, have only a relative value, and for a final test, most reliance must be placed on Müller's attempt at manual engagement of the head. To be of any real service the patient must be anesthetized and while an assistant forcibly pushes the head against the pelvic inlet, a combined examination studies the relative size of the head to the pelvis and estimates the probable degree of disproportion. During this test it is well to have the patient in the Walcher posture.

(b) *The Size and Shape of the Pelvis.*—While the patient is anesthetized, the thickness of the symphysis and the true conjugate are measured by means of the Skutch or Hirst pelvimeter. Then follows a study of the inclination of the pelvic bone (conjugato-symphyseal angle), of the prominence of the sacral promontory; of the straightness or exaggerated curve of the sacrum. The projection and curves of the lateral pelvic walls, the depth of the pelvis, the character of the cervix and pelvic floor are all noted in order to be informed of the general shape and size of the pelvis and of their influence on the mechanism of labor. Even to those who possess a practical knowledge of pelvic deformity and its varying effects upon the mechanism of labor, the examination just referred to will not give results mathematically exact. The degree of moulding, of adaption and lateral inclination of the head that result from effective uterine energy are important factors even more difficult to estimate. As the problem stands to-day it amounts to prophesy, with its truth or falsity depending, not upon exact laws, but upon the individual's skill, experience in this class of work and his resultant judgment. How often these can go astray, each of us well knows if we judge each other by our own standards. For example, I cannot agree with Fry that when the head, after a few hours of labor, cannot be made

to engage by suprapubic pressure, the patient being chloroformed, a Cesarian section is always justifiable; nor would I conclude, as does Reynolds, that section is indicated when a woman with moderate disproportion has had one stillborn baby following a difficult subpubic instrumental labor. I would also take issue with Williams, who, after a careful study of moderate disproportion, declares that the induction of premature labor is never justifiable. These variations in obstetric judgment are referred to in order to emphasize the importance of a closer study of the question before us. Returning to the data obtained from the examination of the anesthetized patient, it is true that only one factor thus discovered is mathematically exact, and that is the measured true conjugate. Considered apart from associated changes in the shape, inclination and general character of the pelvis, it cannot determine the potential obstruction in any given case. Considered with these changes, it is our most reliable guide to the selection of appropriate treatment for individual cases. The external measurements of the pelvis have, in the past, been given too great prominence in the text-books as compared with internal examination and measurement. They have little value to indicate size, but serve a useful purpose to indicate changes in shape, and thus lead to a closer study of pelvic deformity. When found abnormal, they indicate the need of studying the irregularities in the patient's bony frame that can influence the direction, shape, depth, size and the curvatures of the component parts of the true pelvis. Of the variations in shape that will influence the obstetric capacity of the pelvis and modify the mechanism of labor, my experience has led me to pay especial attention to the height of the sacral promontory, the height of the symphysis, the angle of inclination of the pelvic inlet, the angle of inclination of the symphysis, and the degree of curvature of the sacrum. It is unfortunate that all these important factors have not been reduced to precise calculations such as are known to the mechanical engineer in his problems of resistance. Deprive him of his carefully prepared tables and let him attempt his problems with only his senses of sight and touch and personal experiences, and his errors would soon disqualify him. The mechanical problems of obstructed labor must be more definitely systematized before our conclusions in individual cases can be scientifically accurate. Until that has been done, we can only rely on individual judgment with its inherent errors.

(c) *Examination of the Cervix and Vagina.*—The preliminary

examination of the soft parts of the lower birth-canal, as related to obstructed labor, attempts to predict the amount of rigidity and the time and energy required to accomplish dilatation. Heretofore, I do not doubt that no inconsiderable proportion of material mortality and morbidity and a share of infantile mortality are directly to be attributed to the prolonged first stage so characteristic of labor mechanically obstructed. The spent energy of the patient, the premature rupture of the bag of waters with prolapse of the funis, the prolonged pressure that lessens the resistance of the tissues against infection and predisposes the child to increased risk of intracranial lesions have not received sufficient recognition as important factors in so-called test labors. When the cervix is hypertrophied, elongated and rigid, as in elderly primiparæ and in those not sexually active, and when dense cicatrices have followed a trachelorrhaphy in multiparæ—when, in a word, a slow and tedious first stage is expected that will surely exhaust the patient and render her unfit surgically, modern obstetrics offers abundant means to safely dilate the cervix and vagina and to escape a large part of that exhaustion and surgical unfitness.

(d) *The Uterine, Muscular, Metabolic and Nervous Character of the Patient as Related to the Ordeal of Labor.*—Close observation of a patient during her pregnancy to learn how well or poorly she stands the strains common to all pregnancies is valuable, to estimate her powers of endurance, and her nervous and muscular equipment for labor. Prediction can often be made that muscular and nervous energy will be lacking, that the labor will require assistance, often from the very beginning; and when a labor mechanically obstructed is in store for such a patient, it may be taken for granted that the natural forces unaided will be inefficient. To what extent this ill-equipment for labor can determine the choice of treatment is debatable. That it should exclude a prolonged and unassisted test of labor is clear to my mind, and it is also clear that a definite plan of treatment should be selected and then carried out with no delay. Such patients are unfit for prolonged operative procedure, but that they will stand an abdominal operation better than a well-chosen subpubic operation is not in keeping with our surgical tenets of the comparative strain of abdominal and vaginal surgery. The practical bearing of this study of pregnancy is that the obstetrically ill-equipped require above all others accurate determination of the degree of mechanical obstruction, must not be permitted to endure pro-

longed labor, and whenever the estimated obstruction will permit the choice of subpubic delivery, that route is safer for them, because surgically it is less a strain and, if the choice has been wise, it is less dangerous.

The Management of Minor Degrees of Mechanically Obstructed Labor.—(a) Elective Cesarean section. Forceps. Version. The low mortality and morbidity of the elective section for the absolute indication has induced some operators to widely extend the section for the relative indication, arguing that if safest for the absolute it will also be safest for relative indication in the large majority of cases, since it at once eliminates the dangers incident to the test of labor. If the "test of labor" shall be that commonly relied upon in the past, then I am heartily in accord with that postulate. It is my earnest conviction, however, that modern obstetrics has something better to offer than a test of labor to the degree of exhaustion and infection of the patient. The high mortality of the late section is said to be largely caused by the length of labor endured. More important than the mere length of labor is a closer investigation of the fatal cases to determine the frequency and technic of examinations, the degree of exhaustion induced by a prolonged first stage that can by newer methods, be avoided, the violence and duration of unsuccessful intrapelvic efforts undertaken without careful study to assure its probable success or failure. In short, if such a critical analysis of many fatal cases be made, I believe the high mortality rate of late section would be apparent in sepsis and not intrinsically due to the mere length of labor endured. The field for Cesarean section for the relative indications contains the borderline cases (roughly speaking, those nearer to 8 cm. from the stand-point of the pelvis and a primipara with an estimated large infant), in which the section, should be undertaken only after a test of labor has been conducted in the most approved manner. For this test, at the beginning of labor the patient should be prepared for both abdominal and subpubic surgery. If a primipara or highly nervous multipara, she is for a short period given an anesthetic and prepared for dilatation of the cervix.

With an aseptic technic, instrumental dilation of the cervix to the extent of 8 cm., which is free from danger of laceration, followed at once by the insertion of Pomeroy's bag and its progressive but relatively slow distention, will so shorten the first stage of labor and dilate the vagina that the patient, with no

expense of energy, is almost at once brought to the second stage, for which stage her energy is most needed. When the cervix is very rigid and a longer period is required for the bag dilatation, morphia can be employed to allay suffering and with inconsequent delay, since the bag's efficiency is not thereby reduced. Active contractions usually will at once appear, and after the spontaneous extrusion of the bag, if the pains continue, labor is allowed to progress for an hour or two. In the absence of uterine contractions, or after their occurrence for an hour or two, the patient is again anesthetized, carefully examined and the further management having been decided, it is at once undertaken. This management of the first stage of labor adds to the safety of a test labor. It shortens its duration, reserves the patient's strength, preserves the vital resistance of the woman's tissues, and the complete dilatation materially aids a further and more accurate study of the relative proportion between head and pelvis. Under the driving force of the awakened uterine contractions, the mechanism of labor in a flattened pelvis begins, and, as a result of the lateral inclination of the head, the sagittal suture, lying in the transverse diameter of the pelvis, gradually approaches the sacral promontory, and the distance of this diameter from the promontory is a fair index of the disproportion. When, less frequently, the posterior parietal bone first enters the pelvic inlet, the distance between the suture and the symphysis is the index. When the distance between the sagittal suture and promontory has been less than 2 cm., I have never delivered a living child by forceps. In my last sixty high forceps deliveries for mechanical obstacle there has been no maternal mortality, with nine infants' deaths—a mortality of 15 per cent. After the occurrence of strong expulsive pains, the study of the relation between the promontory and sagittal suture determines for me the choice or abandonment of axis traction forceps. The Trendelenburg-Walcher posture should always be used for forceps deliveries until the head has been drawn to the pelvic floor. Version may sometimes save an infant so placed, especially if the pelvis is not generally contracted and the conjugate approaches 9 cm., but with statistics showing an average infant mortality of 20 to 40 per cent., its danger to the child usually warrants the resort to more modern treatment.

It will be noted that up to this point the patient has not been permitted to be exhausted by a long and inefficient first stage and our technic has aimed to prevent infection. The further man-

agement, when spontaneous delivery is improbable and forceps has been barred, must be either section or pubiotomy, according to the operator's personal choice and experience, and the choice having been made, the selected operation should immediately be performed.

If forceps has been persisted in and our judgment in its selection having gone astray, the infant's life is in serious jeopardy, as shown by heart-sounds or cranial injury, craniotomy is the only alternative. The mortality of late section and of late pubiotomy—at least 12 per cent.—is too great to risk the patient's life for a dead or dying infant. Better extricate the woman from her dangerous condition by destruction of the child and, acknowledging our mistaken judgment, retrieve our mistake by securing for her a living child at her next confinement. The important point is to be reasonably sure of forceps before attempting extraction. As in gynecology, the relation between doubt and drainage has been settled in most men's minds, so here, when in doubt, do not use the forceps, but proceed at once to the section of abdomen or pubis.

Pubiotomy and Symphyseotomy.—Recent reports indicate that pubiotomy is steadily replacing symphyseotomy wherever both operations have been practised. In America neither operation has gained many supporters. In Germany, where pubiotomy has flourished of late, it appears that symphyseotomy has at least double the mortality rate of pubiotomy. Döderlein (*Zentralblatt f. Gynäkologie*, No. 24) reported 217 cases of pubiotomy, with 4 per cent. mortality, all the patients that died from infection having shown fever at the time of operation, and among the gravely infected cases the mortality was 12½ per cent. Of the 133 aseptic cases collected by Montgomery (*AMER. JOUR. OBST.*, December, 1906) there was no maternal mortality and no ill effects upon the patients' subsequent gait or health. There seems to be a tendency in America to reserve for the elective Cesarean section the lion's share of aseptic cases and to relegate pubiotomy to a "last resort" operation, giving it an alternate place with craniotomy. A study of its literature shows clearly that as a late operation it is about as dangerous as the late Cesarean section, and as an early operation it has an equally low or lower mortality. My personal experience is limited to two cases, whose detailed reports are herein given, the results in both instances being perfect for both mother and child.

CASE I.—Mrs. E. (Case No. 6018), æt. twenty-six, a multipara, lost her first child during a difficult forceps extraction. In her second labor, forceps had been tried unsuccessfully by her attendant, Dr. Lambert Ott, who called me in consultation. An examination (the hand *in utero*) determined that the child had perished and I delivered her by craniotomy that required crushing of the base of the skull.

Her pelvic measurements were as follows: Interspinous 25, cm.; intercrystal, 27 cm.; external conjugate, $16\frac{1}{2}$ cm.; conjugate vera, 8 c.m. After delivery, her weight was ninety-five pounds; her height was four feet and nine inches. Her third labor at term occurred at the Preston Retreat where she had been admitted several days prior thereto. After four hours of active labor pains, with the bag of waters broken, the head was freely movable above the pelvic brim, the occiput lying to the left. A longitudinal incision above and to the inner side of the left spine of the pubis was made through the sheath of the rectus, only large enough to admit the tip of the index-finger, which located the upper border of the pubic bone just inside the pubic spine. The periosteum was nicked, and the point of the Döderlein needle inserted. A metal catheter placed in the bladder was forcibly drawn to the opposite side by an assistant and the index and middle fingers of the left hand were then passed into the vagina to further push the base of the bladder to one side and the head upward, and having located the tip of the Döderlein needle, guided its point as it was made to hug the posterior surface of the pubic bone, and escaping the margin of the obturator foramen, by a sharp turn of the handle the needle finally swept under the pubic arch ready to emerge through the soft tissues of the labium. The left labium was then strongly dragged toward the median line, and the needle thus was ready to puncture the skin at a point well removed from injury to the labial veins and from contamination with lochial discharge. The Gigli wire saw was drawn into place as the needle was removed. Before beginning sawing, the fingers of the left hand were again placed in the vagina to secure a correct line along which to sever the bone. This line passes just within the pubic spine and avoids the margin of the obturator foramen.

Traction upon the handles of the saw held the latter firmly in this line until a few strokes of the saw were carefully made to insure accurate section of the bone along this line. When the bone had been completely severed there was free oozing from the

upper opening, probably from the cut bone, but none from the lower puncture. The bleeding was at once permanently controlled by a small gauze pack placed in the wound and between the separated ends of the bone. The ends were separated a finger's breadth as soon as the section of the bone was complete. The cervix being completely dilated and the vagina relaxed, axis traction forceps brought the head into the pelvis. Care being exercised not to put sudden strain on the bladder and vaginal



CASE I.

attachments. During the traction the ends of the severed bone separated three fingers' breadth, two assistants meanwhile making counter-pressure upon the trochanters. A living child weighing seven pounds and fourteen ounces was quickly delivered. The gauze pack was then removed from the upper incision; there was no bleeding; the two small skin incisions were closed each with one silkworm-gut stitch, the upper including the split fascia of the rectus.

A wide adhesive strip was applied around the pelvis and the

patient placed upon a Bradford canvas frame for her comfort and the convenience of her care during the puerperal period.

The convalescence of mother and child was normal in every respect, the temperature and pulse never rising above the normal. On the twenty-sixth day an examination failed, much to my surprise, to find a trace of callus. The incised bone was in perfect apposition and united, whether by bony or fibrous union



CASE II.

I do not know. The patient left the bed on that day, walked without discomfort and returned to her home on the thirty-first day.

CASE II.—Mrs. G. (Case No. 6258), a primipara, æt. twenty-two. Menstruated April 9-12, 1907. Pelvic measurements: Interspinous, 26 cm.; intercrystal, 28 cm.; external conjugate, 18 $\frac{3}{4}$ cm.; true conjugate, 9 cm. Face presentation, R. M. A.

Labor began January 10, 1908. Feeble pains throughout the

day. At midnight, cervix size of silver dollar; inefficient pains, no engagement, patient beginning to be exhausted. Under ether, manual dilatation of cervix, followed by attempt to flex head and apply tentative forceps. Head estimated as of average size. Impossible to maintain flexion and apply forceps to L. O. P. Forceps then applied to persistent face presentation. Tentative traction showed grave mechanical obstruction and probable destruction of infant. At 4.15 A. M., pubiotomy (Döderlein technic) saw applied to left pubic bone as in Case I. No bleeding from either skin incision. Separation at once admitted one finger. During traction separation to two and a half fingers. One silkworm-gut suture in each incision. No drainage. One stitch in small laceration of perineum. Attempts to apply forceps to flexed head failed, and face presentation delivered with forceps. Infant slightly asphyxiated, revived in hot bath. Weight, five pounds, nine ounces. Convalescence of mother and infant afebrile.

The patient left her bed on the twenty-fifth day and walked without difficulty. Examination at that time found no trace of callus on the posterior surface of the bone, on the anterior surface there was some thickening that gradually disappeared. The accompanying X-ray photographs show the results to the incised bone.

Indications, Advantages and Accidents.—The degree of pelvic deformity indicating pubiotomy is the same as that ordinarily given for the relative indication of Cesarian section *i.e.*, a conjugata vera to 7 cm. The majority of operations thus far have been done for cases with contraction between 7 and 8.5 cm. To replace embryotomy, it has also been recommended and performed in cases of impacted face or brow presentation. It has been recommended to place the saw ready for section of the bone as a prophylactic measure when about to extract a difficult breech presentation or after version. Aubert (*Revue médicale de la Suisse romande*, 1906, No. 1) believes it will replace the induction of labor for the lesser degrees of pelvic contraction. A view of the more enthusiastic supporters have even justified its performance without subsequent retaining dressing in order to permit of permanent enlargement of the pelvis. A new operation is always carried to extremes and pubiotomy will doubtless show the same history in this respect as did symphysiotomy. The increase in the diameters is given by Van Cauvenberghé (*L'Obstétrique*, January, 1905) from experiments on seventeen

cadavers as follows: A separation of the cut ends of the bone of 3 cm. increased the conjugata vera 1 cm.; the transverse, 1.4 cm.; both oblique diameters, 1.3 cm. A separation of 4 cm. is likely to damage the sacroiliac joint. Waldstein (*Zentralblatt für Gynäkologie*, xxx, 7) declares the conjugata vera in the normal pelvis is increased 8 per cent. of its length; in the rhachitic pelvis, over 25 per cent. The space gained is about the same as is gained with symphysiotomy with equal separation of the bones.

The advantage of pubiotomy lies in the fact that the supports of the bladder and urethra and the clitoris and structures behind the symphysis are not only not cut, but also are not so likely to be lacerated by the bilateral traction caused by the separation of the bones.

Lacerations of the vagina and unavoidable hematomata have been the most frequent accidents thus far reported. Under aseptic conditions these really are not serious and often may be avoided by a proper technic of operation and by a proper method of delivery. Bauereissen (*Münchner medizinische Wochenschrift*, Nos. 51, 52, 1905) has demonstrated that the hemorrhage originates especially from the corpus cavernosum, the bulbus vestibulæ, the vesical plexus, the veins of the urogenital diaphragm, and possibly the pubic branch of the inferior epigastric and obturator arteries. This complication of hemorrhage or hematoma has led to the discussion of three methods of operating—the open, the partially subcutaneous and wholly subcutaneous methods. With my present light on this question, I shall again use the partially subcutaneous method, hoping to avoid hemorrhage, as has so frequently happened; but at the occurrence of serious bleeding I would not hesitate to change at once to the open method, cutting down to the bone and controlling the bleeding by ligation. Hemorrhage from the vulvar veins ought to be avoided, and was in my cases by drawing the vulva firmly to the median line, when the lower puncture is made and holding it there until the bone is cut through.

The other accident, tearing of the vaginal or cervical attachments, ought to be avoided by careful delivery after section of the bone. Spontaneous delivery, as has been urged by many operators, and especially in primigravidæ, ought not to be necessary if the soft parts have been prepared by thorough dilatation, as can be done by the large-size Pomeroy bag which I have found most efficient, allowing it to remain in place fully

TABLE A.

	Age.	Gravida.	History of Previous Labors.	Variety of Pelvis.	True Conjugate.		Presentation and Position.	Last Catamenia.	Confinement Expected.
					cm.				
Mary N. No. 1	32	VIII	Five living children. Two stillborn. All labors difficult. Delivered Oct. 26, 1893, at term; high forceps. Infant 7 pounds.	Flat rachitic	8.5	L. O. A.	May 28, 1894	Feb. 4, 1895	
Annie D. No. 2	20	I		Flat rachitic	8.75	Breech	June 12, 1895	Mar. 19, 1896	
Annie D. No. 3	21	II	First labor induced at Retreat (see above, Case No. 2).	Flat rachitic	8.75	L. O. A.	July 26, 1896	May 2, 1897	
Elizabeth A. No. 4	23	II	First labor; infant 6 lbs. 10 ozs.; stillborn; delivery spontaneous at term. Bitemporal 8; biparietal 9½ cm.	Flat	8.5	R. O. A.	Nov. 12, 1896	Aug. 19, 1897	
Catherine McL. No. 5	35	IV	First pregnancy; 3 days in labor at term; infant dead; spoon-shaped depression in parietal bone. Second pregnancy; miscarried at third month. Third pregnancy; symphyseotomy at Retreat ten days after term; infant lived one year and died of croup.	Flat rachitic	8.	L. O. A.	Jan. 7, 1897	Oct. 14, 1897	
Albertina G. No. 6	29	III	Two labors at term; difficult forceps; infants stillborn.	Flat	9.	Right shoulder	Feb. 10, 1897	Nov. 17, 1897	
Mary L. No. 7	24	I		Flat	9.	R. O. A.	Sept. 27, 1897	July 4, 1898	
Mary McG. No. 8	39	V	Four labors at term; all difficult forceps; all infants stillborn.	Flat	9.25	L. O. A.	Not known	Oct. 9 (estimated from quickening)	
Elizabeth A. No. 9	25	III	See Case No. 6	Flat	8.5	L. O. A.	Dec. 12, 1898	Sept. 19, 1897	

LABOR BEFORE FULL TERM.

TABLE A.—(Continued.)

Labor induced before Term.	Hrs. | Duration of Labor.	Method of Delivery.	Puerperal Convalescence.	Infant.							
				Weight.	Bitemporal. cm.	Biparietal. cm.	Occipito-frontal Circumference. cm.	Condition at Birth.	Condition on Discharge.	Present Condition 1904 (July).	Remarks.
One week	22	Natural	Normal	7 lbs. 2 ozs.	8.	9.	34.	Normal	Normal	Living	
Sixteen days	36½	Natural	Normal	7 lbs.	8.	9.25	33.	Dead			Prolapsed cord pulseless when discovered; large spina bifida incompatible with life; length of cord 85 cm.
Two weeks	11	Natural	Normal	6 lbs. 12 ozs.	7.	8.5	32	Normal	Normal	Living	
Two weeks	6½	Natural	Normal	6 lbs. 2 ozs.	7.	8.	31.	Normal	Normal	Living	
Eighteen days	34½	Version	Normal	6 lbs. 3 ozs.	7.	8.	32.	Normal	Normal	Living	
Four weeks	23	Version	Normal	7 lbs. 4 ozs.	8.	8.75	32.	Normal	Normal	Living	
Three weeks after calculated term	34	Natural	Normal	6 lbs. 4 ozs.	7.	8.75	31.5	Normal	Normal	Living	Admitted June 22 about two wks before estimated term; relative size of head to pelvis (estimated), permitted pregnancy to continue to July 25, estimated as nearly two weeks prior to full term.
Three weeks	37½	High for-caps	Normal	6 lbs. 14 ozs.	8.	9.	32.5	Normal	Dead		Death of infant on fifteenth day from omphalitis. Quickening occurred May 14.
Ten days	53	Natural	Normal	7 lbs. 13 ozs.	7.75	8.75	32.	Normal	Normal	Living	

TABLE A.—(Continued.)

	Age.	Gravida.	History of Previous Labors.	Variety of Pelvis.	True Conjugate. cm.	Presentation and Position.	Last Catamenia.	Confinement Expected.
Annie D. No. 10	23	III	See Cases Nos. 3 and 5	Flat rachitic	8.75	Breech	Jan. 10, 1899	Oct. 17, 1899
Catherine McL. No. 11	39	V	See Case No. 5	Flat rachitic	8.	L. O. A.	June 11, 1899	Mar. 18, 1899
Mary H. No. 12	33	VI	One miscarriage; two premature stillbirths; two living children (small) after forceps.	Flat	8.75	R. O. A.	Sept. 18, 1899	June 25, 1900
Annie D. No. 13	25	IV	See Cases Nos. 2, 3, 10.	Flat rachitic	8.75	L. O. A.	Sept. 12, 1900	June 19, 1901
Catherine McL. No. 14	39	VI	See Cases Nos. 5 and 11	Flat rachitic	8.	L. O. A.	Jan. 6, 1901	Oct. 13, 1904
Catherine McL. No. 15	40	VII	See above Cases Nos. 5 and 14	Flat rachitic	8.	L. O. A.	June 17, 1902	Mar. 24, 1903
Mary O'R. No. 16	28	II	First labor; difficult forceps; infant stillborn; three doctors in attendance	Flat	9.5	L. O. A.	Oct. 14, 1902	July 21, 1903
Daisy P. No. 17	31	III	First labor induced by Dr. Dorland; infant living. Second labor induced by Dr. Sprenkel; infant died from omphalorrhagia.	Flat	8.5	L. O. A.	Mar., 1903 (Date uncertain; probably in Mar.)	Dec. 28, 1903 (Probable estimation)
Catherine McL. No. 18	41	IX	See Cases Nos. 5, 11, 14, 15.	Flat rachitic	8	R. O. A.	Feb. 7, 1903	Nov. 14, 1904
Margaret McD. No. 19	35	IV	3 forceps deliveries; 2 infants stillborn	Flat rachitic	9	S. O. A.	April 24, 1907	Feb. 1, 1908
Bertha M. No. 20	50	VI	3 difficult forceps deliveries. Children survived.	Rachitic	10	R. O. P.	Nov. 22, 1905	Aug. 29, 1906

BEFORE FULL TERM.—Continued.

TABLE A.—(Continued.)

Labor induced before Term.	Hrs. | Duration of Labor.	Method of Delivery.	Puerperal Convalescence.	Infant.							Remarks.	
				Weight.	Bitemporal.		Biparietal.	Occipito-frontal Circumference.	Condition at Birth.	Condition on Discharge.		Present Condition 1904 (July).
					cm.	cm.	cm.					
Two weeks	52½	Breech extraction	Normal	4 lbs. 5 ozs.	7.	8.	29.	Asphyxiated	Dead			Infant died 12 hrs. after birth. Date of last catamenia acknowledged by patient to be an error. Pregnancy terminated at least six weeks before term in consequence of that error.
Three weeks	48	Version	Normal	7 lbs. 1 oz.	8.25	9.25	34.	Normal	Normal	Living		
One week	38	Natural	Normal	6 lbs. 14½ ozs.	8.	9.	32.5	Normal	Normal	Living		
Two weeks	21	Natural	Normal	7 lbs. 6 ozs.	7.5	8.75	32.	Normal	Normal	Living		
Three weeks	29	Version	Normal	6 lbs. 9 ozs.	7.25	8.25	32.5	Normal	Normal	Living		
Eighteen days	31	Natural	Normal	6 lbs.	7.	8.	31.	Normal	Normal	Living		
Nineteen days	26	Natural	Normal	7 lbs.	8.	8.5	32	Normal	Normal	Living		
Two weeks	9½	Natural	Normal	5 lbs. 8 ozs.	7.5	8.75	31.	Normal	Gaining in weight	Living		Dates of last period and quickening not definitely known. Infant in incubator four weeks.
Four weeks	20½	Version	Normal	5 lbs. 13 ozs.	8	9½	12	Normal		Living 1908		
Two weeks	6½	High forceps	Normal	8 lbs. 12 ozs.	9	10	12	Asphyxia: revived		Living		
Ten days	12	Natural	Normal	7 lbs. 10½ ozs.	8	9½	12½	Normal		Living		

TABLE B.

	Age.	Gravida.	History of Previous Labors.	Variety of Pelvis.		Presentation and Position.	Last Catamenia.	Confinement Expected.
					True Conjugate. cm.			
Annie G. No. 1	28	I		Flat rachitic	8.5	R. O. A.	May 17, 1895	Feb. 14, 1896
Elizabeth D. No. 2	32	III	First labor, difficult forceps; infant stillborn, 2d labor at Retreat; admitted 10 days beyond term and in labor, High forceps. Infant died in 48 hrs. from aspiration pneumonia.	Flat.	9.5	L. O. A.	Dec. 26, 1895	Oct. 2, 1896
Maria V. No. 3	35	VII	3 miscarriages, 3 forceps. All babies stillborn	Justo-minor	9.75	L. O. P.	Oct. 16, 1894	July 23, 1895
Elizabeth P. No. 4	19	II	Living $3\frac{1}{2}$ lb. infant after a 3 days, labor and forceps delivery	Flat rachitic	9	L. O. A.	Dec. 29, 1894	Oct. 8, 1895
Annie Le.D. No. 5	38	VII	3 miscarriages, 2 forceps infant stillborn	Justo-minor	10	L. O. A.	April 27, 1906	Feb. 1, 1907
Matilda A. No. 6	20	I		Rachitic	10	L. O. A.	Aug. 22, 1906	May 29, 1907
Louisa H. No. 7	20	I		Flat rachitic	10	R. O. A.	April 29, 1907	Feb. 4, 1908
Agnes deN. No. 8	22	I		Justo-minor	10	L. O. A.	May 25, 1907	March 1, 1908
Mary H. No. 9	17	I		Justo-minor	10	L. O. A.	May 12, 1907	Feb. 15, or 17 1908
Mary W. No. 10	18	I		Justo-minor	10	L. O. H.	July 21, 1907	April 28, 1908

AT OR LATER THAN FULL TERM.

TABLE B.—(Continued.)

Labor induced before Term.	Hrs. | Duration of Labor.	Method of Delivery.	Puerperal Convalescence.	Infant.						Present Condition 1908 (July).	Remarks.
				Weight.	Bitemporal. cm.	Biparietal. cm.	Occipito-frontal Circumference. cm.	Condition at Birth.	Condition on Discharge.		
	93	Version followed by craniotomy	Normal	7 lbs.	8.5	9.5	35	Dead			Admitted Feb-9. Delivered by assistant, Dr. H. W. Hassell. Occiput posterior after version; chin lock'd above symphysis; infant perished and finally delivered by craniotomy.
At term (estimated)	13	Natural	Normal	5 lbs.	7	7.6	29	Premature and feeble. Died after 24 hrs.			Patient admitted one month prior to calculated term. Three inches of fat in abdominal wall; infant very small, labor not induced until calculated term had been reached.
4 days after time	14½	Version	3 days elevated temperature	9¼	8½	9.5		Still-born			Cesarian section not permitted.
8 days after term	10	Natural	Normal	6 lbs. 2 oz.	7½	9		Normal	Normal		
3 days after term	11½	High forceps	Normal	5 lbs. 11 oz.	7.5	10	36	Normal	Normal		
15 days after term	24	Natural	Normal	6 lbs. 14 oz.	8	9.25		Normal	Normal		
17 days after term	25	High forceps	Normal	7 lbs. 5 oz.	8.75	9.5	3.5	Asphyxia			Died 10 hrs. after birth; Compression.
at term	5	Natural	Normal	6 lbs. 9 oz.	7.5	9.5	35.5	Normal	Normal		
10 days after term	2½	Natural	Normal	7 lbs. 10 oz.	7.5	9	34	Normal	Normal		
23 days after term	28½	Natural	Normal	6 lbs. 6 oz.	9¼	10¼	34½	Normal	Normal		

TABLE C.—PRIVATE PATIENTS; INDUCTION OF LABOR BEFORE TERM.

Name and Year.	Gravida.	History of Previous Labors.	Variety of Pelvis.	True Conjugate.	Labor Induced Before Term.	Method of Delivery.	Infant.	
							Condition at Birth.	Present Condition.
Mrs. D. 1894 No. 1	I		Simple, flat	9 cm.	14 days	Forceps	Normal	Living
Mrs. C. 1895 No. 2	II	High forceps; infant stillborn; fracture of skull.	Flat, rachitic	8½ cm.	18 days	Version	Normal	Living
Mrs. W. 1899 No. 3	I		Simple, flat	9½ cm.	14 days	Natural	Normal	Living
Mrs. H. 1901 No. 4	I		Flat, rachitic	8¾ cm.	15 days	Forceps	Normal	Living
Mrs. M. 1902 No. 5	II	Difficult forceps; fracture of pelvis; infant survived.	Simple, flat	9¼ cm.	14 days	Forceps	Normal	Living.
Mrs. H. 1903 No. 6	II	Labor induced three weeks before term; infant living.	Flat, rachitic	8¾ cm.	14 days	Natural	Normal	Living.
Mrs. T. 1903 No. 7	III	Two stillborn infants; high forceps	Simple, flat	9 cm.	14 days	Forceps	Normal	Developed as- piration pneu- monia fifth day
Mrs. S. 1905 No. 8	II	High forceps; infant deeply asphyxiated, but survived.	Justomnior	10 cm.	14 days. Head not in pelvis.	Natural	Normal	Living
Mrs. C. 1906 No. 9	III	Two version and extraction at term; one stillborn infant	Flat, rachitic	9 cm.	3 weeks	Version	Stillborn	
Mrs. H. 1908 No. 10	IV	Two high forceps; infants large and stillborn; one miscarriage.	Justomnior	8½ cm.	4 weeks	Breech extraction	Asphyxiation; recovered	Living

TABLE D.—INDUCTION OF LABOR AT TERM.

Mrs. L. 1902 No. 1	I		Justomnior	10 cm.	At term	Forceps	Normal	Living
Mrs. C. 1902 No. 2	II	Stillborn infant after difficult version at term	Flat, rachitic	9 cm.	At term	Version	Normal	Died on third day from sud- den intraperi- toneal hemor- rhage (autopsy)
Mrs. R. 1902 No. 3	I		Simple, flat	10 cm.	At term	Forceps	Normal	Living
Mrs. S. No. 4	I		Justomnior	10 cm.	At term	Forceps	Normal	Living

distended for two or three hours, if not spontaneously extruded by the strong pains it usually excites. The cases in which extensive lacerations of the vagina have been reported have usually been posterior positions, and this fact should make us cautious about forcible and rapid anterior rotation. Bauereissen (loc. cit.) has called attention to the fact that instrumental delivery increases the danger of tearing the vagina, and that the laceration of the deep transverse perineal muscles eventually leads to vaginal prolapse. The pelvic floor is drawn upward as the bones separate; the depth of the vagina is thus shortened and rotation interfered with. Forcible rotation should be most cautious and will be least dangerous when the soft parts have been overdistended and stretched by the preliminary use of the large Pomeroy bag. Manual rotation at the brim of a posterior occiput, converting the latter into an anterior position before applying forceps is a valuable means of preventing the lacerations that have occurred at the site of the incised bone, when the rotation is accomplished with the forceps after the head has entered the pelvic cavity. During traction with the forceps it is a precaution to have assistants make counter-pressure upon the trochanters to prevent too wide separation. Sellheim (*Beiträge zur Geburtshülfe*, x, 3) advises against the employment of the Walcher posture, declaring it, after section of the pubes, to be not only superfluous, but positively dangerous to the capsular ligaments. The increase in the conjugate is for the most part at the expense of the sacroiliac joint, hence the section should be made on that side through which the biparietal diameter of the head must pass. The breaking of the saw is an accident that has frequently occurred and warrants having in readiness more than one saw. The frequent occurrence of hematomata after the subcutaneous operation calls for most careful asepsis. The tip of the needle should be held firmly in contact with the posterior surface of the pubic bone, under the periosteum, if that is possible, during its passage. By this means the cutting of blood-vessels with this saw is avoided. Rupture of these same blood-vessels when the cut ends of the bones separate is an accident not always to be avoided. Using the finger as a guide in passing the needle helps to push the bladder aside and prevent its injury.

From this brief discussion of the operation it will be seen that there are many accidents that can attend pubiotomy, and that it is an operation to be undertaken by those who possess some

surgical skill. In the hands of the average surgeon in private practice it appears to me as certainly safer than Cesarean section, and the future may prove that even in the expert's hands and in a well-equipped clinic its results will make it replace the elective Cesarean operation for its relative indication.

Induction of Premature Labor.—The recent writings of most American obstetricians follow those of continental Europe in condemning the induction of premature labor in the treatment of labor obstructed by pelvic contraction, because of the high fetal mortality, and I am in hearty accord with that teaching for the major degrees of disproportion. For the lesser degrees of contraction represented in a general way by the pelvis with conjugates between 11 and 8 cm., I am convinced that the skillful induction of labor, never before the eighth month and at the latest period of pregnancy permissible by the studied disproportion, not only should not be abandoned, but deserves a more general application by the profession to the elective treatment of the lesser degrees of disproportion. The results of nature's unaided efforts at term—the so-called expectant treatment—is the one unanswerable argument of those who maintain the necessity of the test of labor in moderate disproportion. To aid nature by bringing the patient to labor two to four weeks before term increases her efficiency and is no detriment to the child.

Krönig (*Die Therapie beim engen Becken*, Leipzig, 1901) and Zweifel have studied a large series of obstructed labors in Leipzig, and with conjugates in flat pelvis between 8.5 and 9.5 cm., assistance was required in 2.7 per cent. of the cases, and in even the generally contracted pelvis (272 cases), with conjugates between 8.5 and 9.5 cm., no assistance was required. My plea is that it is sound obstetrics to give nature the little assistance she may need to save the children that without this aid are frequently lost through errors in obstetric judgment after version or a difficult forceps extraction at term. Induction of labor gives that assistance and, if more generally indorsed by the obstetric leaders, it will more efficiently teach the profession to study their cases before labor than the doctrine of early Cesarean section, because the former is within their obstetric judgment and surgical skill, while the latter is not. To accomplish the best results after the induction of premature labor, two additional problems are added to the study required for the elective Cesarean section. These are the determination

of duration of pregnancy, and the care of the premature infant after its birth. The interruption of pregnancy must not be earlier than the degree of disproportion demands, nor at a period so late that a difficult operative delivery is required which increases the mortality even of children not excessively premature.

At first thought, this would seem to increase the burden of knowledge required of the general practitioner, but on investigation it will appear that these problems are more easily and safely determined by him and their solution renders less dangerous the errors he may make in the more difficult problem of accurate estimation of relative disproportion between head and pelvis. Given a conjugate between 8 and 10 cm., a head not unduly large, the patient at the eighth month of pregnancy and a reliable method for instituting labor, and the problem is solved. The dangers of infrapubic operations, in cases of prolonged pregnancy, are prevented by the induction of labor and is additional argument for its more general application.

The determination of the exact duration of pregnancy or its equivalent, the degree of prematurity of the child at the time selected for terminating the pregnancy, is the only practical difficulty of this subject. Pinard's tables of average measurements of the bipetoral diameters compared with results obtained by Stone's or Perret's methods afford some help. Müller's suprapubic pressure should also be used to study the disproportion. Reliable knowledge of the cessation of menstruation and of the date of quickening, the probable date of conception of which sometimes the patient, for some special reason, believes she has knowledge, give the best criterion for judging the duration of pregnancy. The possibility of conception having occurred in the premenstrual and not in the usual postmenstrual days can be a source of error of as much as two or three weeks. The date of quickening to some extent checks this error, but when the probable date of conception is thus in doubt, if the other factor, the relative size of the head to the pelvis will permit it, the date selected for inducing labor should be deferred from ten days to two weeks.

The errors that may be made in selecting the time for interference is the common objection to inducing labor. When it is remembered that labor is not to be induced prior to the eighth month, an error of ten days or two weeks, which is not common in the predictions we make for the dates of confinement of our

patients, will not seriously detract from the value of induced labor for moderate pelvic deformity.

The other objection—the inefficient means at our disposal for terminating pregnancy—can only be offered by those who have little or no experience with inducing labor. The method I now employ is that referred to above, when discussing the means to shorten the first stage of labor. The patient is anesthetized if necessary and the cervix is dilated with a two-branched dilator, aided by the index-finger, to 8 cm., which will not produce laceration, and the large-size Pomeroy's bag is at once placed. The cervical compartment is filled with sterile water, the vaginal compartment is partially distended and the anesthetic is removed. At intervals of fifteen to thirty minutes the vaginal compartment is gradually filled until completely distended by a forceful piston syringe. The bag remains in place until extruded by the forces of labor which it usually promptly calls into existence. If not extruded, intermittent tractions are made. In my hands it has never failed to terminate the first stage of labor more promptly than any method heretofore employed. After several hours of strong pains, the patient being in the Walcher posture as much of the time as her comfort will permit, the progress of labor is observed. Operative assistance is deferred for a somewhat longer period than at term because of the increased risk to the child from forceps or version. After a fair test of the natural forces, which usually are sufficient, an operative delivery is undertaken, guided by the conditions that may be present and by the principles which determine the choice of procedure in a labor at term.

Analysis of the appended tables shows that of twenty cases of induced labor in hospital practice and ten cases in private practice, the conjugates ranging between 8 and 10 cm., labor was induced from two to four weeks before term, depending upon the estimated disproportion. The primary infantile mortality in these cases was three stillborn infants, and one infant's death on the fifth day from aspiration pneumonia. The death of one of the stillborn infants was due to prolapse of the umbilical cord—a very rare accident in induced labor. (Less than 1 per cent. in my experience). A second stillbirth was due to an error in calculating the duration of pregnancy, the result of deception on the part of the patient. The third stillbirth followed a difficult version on a patient presumably four weeks before term, in whom an error in calculation had also been made. There

was no maternal mortality and no morbidity. In contrast with these results, the tables showing the infantile mortality of cases for which labor was induced at or subsequent to full term are most instructive. In fourteen such cases, with a range of pelvic obstruction averaging less than in the former class, there were eight operative cases, as compared to thirteen operative cases in the thirty cases. More important, however, is the fact that there were five infantile deaths in fourteen cases, as compared to three deaths in thirty cases in which labor was induced before term—a respective infantile mortality of 39 and 10 per cent. An additional table of induced labor during the last three years of private practice for prolongation of pregnancy in primiparæ who had reached or advanced beyond term with the head freely movable above the pelvic inlet, shows in fourteen cases six forceps deliveries with no maternal mortality and the loss of one infant. Thus in fifty-eight cases of induced labor there has been no maternal morbidity or mortality and the infant mortality has been 14 per cent., the large proportion of which followed labors induced at or beyond full term. My experience in these cases of labors induced at or past term, associated with difficult subpubic operative delivery, was acquired several years ago. To-day they would be delivered, after the test labor, by section of the abdomen or pubis. That experience, however, has taught me that induction two to four weeks before term is a most useful operation to prevent difficult operative delivery and high infant mortality at term. When the cases are at term, induced labor aids natural delivery and increases the safety of a test labor, but after that aid has failed, forceps or version must be more and more abandoned for pubiotomy or Cesarean section. My experience justifies that conclusion. As to the choice of those operations, I must confess that my training in abdominal surgery and my knowledge of the modern technic of the section forces me, like most American obstetricians, to prefer the abdominal method. Future study and experience may change this attitude. When a patient escapes the dangers of peritoneal infection and hemorrhage and recovers from the Cesarean operation the story is not wholly told. The abdominal scar, adhesions, fistulæ, hernia, subsequent uterine rupture and the general strain upon the patient, while dependent in large measure upon the technic of the operator, are not to be entirely omitted from the comparison between the after-histories of pubiotomies and Cesarean sections. The enthusiasm for pubi-

otomy that exists abroad and especially in Germany, and its reluctant acceptance by America, can only be explained in one way—either they are dissatisfied with their results of Cesarian section or we are better abdominal surgeons and are satisfied with ours. I can scarcely believe that is true, and therefore conclude that we should give pubiotomy an extensive trial, as they are now doing.

Obstruction to labor due to anomalous conditions of the cervix requires but brief discussion. I have recently expressed my views on "Artificial Dilatation of the Cervix" in *American Medicine* (vol. ix, No. 20, May 20, 1905). For relatively slow dilatation, the use of Voorhee's or Pomeroy's bags, preceded by partial instrumental dilatation, has supplanted all other methods in my experience. Measured by the standard of relatively quick results, by its physiological effacement of the cervix and by the absence of lacerations associated with the rapid manual and instrumental methods, it has been wholly satisfactory. For the group of cases that require relatively rapid opening of the lower birth-canal, such as obstruction to the cervix due to cancer, stenosis, myoma or extreme rigidity and for grave maternal conditions which may be relieved by prompt emptying of the uterus, Dührssen's vaginal hysterotomy, or some modification of it that may be indicated by special conditions, is infinitely safer, more surgical and more certain than any other means known to modern obstetrics.

My remarks have been dictated by personal experience and are offered to introduce these most important topics in obstetrics for your discussion. What you will have to say will determine for a large number of American obstetricians the guiding principles of their daily work among thousands of women. That you will be learned and guided by the wisdom of experience goes without saying. Our session deserves that you be practical as well as philosophical and that your discussions shall be brief and to the point.

DR. EDWARD REYNOLDS, of Boston, read the second paper, which will appear later in this JOURNAL.

DR. EGBERT H. GRANDIN, of New York, in the third paper of the symposium, said that mechanical obstruction to delivery might be offered, first, by the pelvis, and, second, by tumors in the lower uterine segment or of the vagina; third by the presenting fetal part, and, fourth, by the cervix of the uterus.

As to mechanical obstruction due to the pelvis, in lesser de-

grees of contraction induced labor should be the operation of election. The rule he had laid down for himself was a simple one: just so long as under suprapubic pressure the presenting part could be made to accommodate itself to the pelvic brim, just so long might we refrain from interference. When accommodation began to fail, then, after one or another fashion, labor should be induced, irrespective of the fact that prematurity of the child was against its survival. This rule for him was an absolute one, unless the parents elected a major operation at term. Where the case was not seen until the time for the rational induction of premature labor had passed, that is to say, when the presenting part could not be made to enter the pelvic brim, the choice lay between forceps, version, and the abdominal Cesarean section. Here there were a number of factors which controlled the choice of methods. Ideally, the Cesarean section, before the onset of labor, or just after, should be elected. Such election, however, in private practice, was only possible where the consent of the man and the woman was secured. The glamor surrounding the statistical data offered by individual operators should not blind one to the fact that all women could not control the services of the expert. The author's rule was, if Cesarean section were declined to calmly await the advent of labor and, when the proper conditions were present, to perform an elective version. His experience had taught him that when under the natural efforts the presenting head did not engage, it was safer for the maternal parts and less dangerous to fetal life to deliver by the more readily moldable after-coming head than to drag the before-coming head through by forceps. The version having been accomplished, where delivery failed, if the fetus was still alive and the consent of the parents was secured, he found a field for symphyseotomy, since the alternative was embryotomy. Even so, basiotripsy of the after-coming head carried less risk of injury to the woman than perforation of the before-coming head unengaged at the brim. Hebotomy, in view of the lesions suffered by the woman, and all who had read recent American literature would agree with him that they were little short of damnable, he unhesitatingly rejected. Where the presenting part of the fetus was other than the head, considerations offered which would best be noted under the subdivision relating to the fetus. Under the present subdivision, neither the Dührssen operation nor the vaginal Cesarean section claimed consideration.

The author then discussed mechanical obstruction due to tumors in the lower uterine segment or occluding the vagina. He also spoke of mechanical obstruction due to the fetus.

The author stated his preference for version and his objections to high forceps. Whenever, under the influence of well-directed uterine efforts, the head did not engage, he was opposed to tentative forceps traction. Where the conditions for version were failing, that is to say, the head above the brim, or slightly en-

gaged and movable and the membranes unruptured, in preference to forced version he would advise symphysiotomy. In the event of the pelvis being abnormal, with complicating excess in the size of the fetal head, when satisfied that the mechanical problem was such that the head could not enter the brim, the consent of the parents should be secured and an abdominal Cesarean section performed; the child, of course, being viable and alive and the physical condition of the women not contraindicating. In these instances, neither the Dürrssen operation nor the vaginal Cesarean section entered as factors. Where the presentation was other than the head and the dystocia was simply due to the malpresentation, the ordinary rules of obstetric procedure applied. Where, in addition, to the malpresentation, there existed pelvic contraction, the author's choice of method for delivery was the abdominal Cesarean section, other things being equal.

After considering mechanical obstruction depending upon the cervix, the author desired to establish specifically these general deductions: *First*, he was in hearty accord with the modern tendency of widening the sphere of the elective Cesarean section. *Second*, he did not believe that either symphysiotomy or hebotomy could ever be made operations of election, and that when either was demanded, the first should be given the preference. *Thirdly*, as he viewed an experience of nearly thirty years, he was glad that Nature now rarely caused him to destroy the living child.

THE INDICATIONS FOR CESAREAN SECTION.*

BY

BARTON COOKE HIRST, M. D.,

Philadelphia, Pa.

It is the intention of this paper to discuss two questions in the study of indications for Cesarean section; namely, the reasons for preferring induction of labor within the last month of gestation in cases of moderate contraction of the pennis and the fallacy of the recent statements that Cesarean section is a dangerous operation if performed after some hours of active labor pains. To take up all the alternatives in obstructed labor—forceps, version, symphyseotomy, pubiotomy, induction of labor, vaginal and abdominal Cesarean section—would occupy more time than should be allotted to one paper; besides, there is little new to be said about forceps or version, and as for symphyseotomy and pubiotomy, after a trial of both I find them very much alike and equally objectionable.† Pubiotomy, in my judgment, going

* Read before the American Gynecological Society at Philadelphia, May 26-28, 1908.

† I have had seven symphyseotomies and two pubiotomies.

the way of symphyseotomy, laparelytrotomy and all the other substitutes for Cesarean section, will be little heard of in the future. The only valid argument in its favor at present is that it is safer than Cesarean section after a labor of some duration in which there have been vaginal examinations or intrauterine manipulations. No one endowed with an ordinary amount of common sense and experience could prefer it to Cesarean section if the two operations had the same mortality, in view of the necessity for numerous assistants, the danger of injury to the bladder, the likelihood of an awkward hemorrhage in the subcutaneous operation, the dubious outlook for the infant which must traverse the birth-canal, the imperfect union of the pubic bones and the atrocious inconveniences of the woman's convalescence. No one with experience in both operations, I think, could prefer pubiotomy to Cesarean section unless he honestly believed it to be the safer operation. But statistics do not support this contention and I hope to show that the evolution of Cesarean section has not ceased; that the best operative and aseptic technic enables one to resort to Cesarean section with impunity in spite of hours of labor pains and even with an infected lower birth canal.

As to the first proposition, that induction of labor within the last four weeks of gestation is preferable to Cesarean section at term in cases of moderate contraction of the pelvis, in which a child of about five pounds in weight with head diameters on the average 1 cm. less than normal and with a compressible cranium can easily pass through the birth-canal or can be safely assisted through, whereas a full-sized child at term could not pass without experiencing fatal damage, even the most prejudicial advocates of Cesarean section or pubiotomy as against induction of labor will admit that the latter is the safer operation for the mother. The whole question therefore hinges on the safety of the infant. The hospital statistics of Germany would make the induction of premature labor appear little better than craniotomy, and, if they held good for our part of the world, would condemn the operation without further discussion. But they do not. Two years ago I published some statistics of more than 200 induced labors from one hospital service alone. My total experience has been a good deal more than double that figure. The result of this experience leaves me a firm believer in the efficacy of induced labor. Infants born at any time within the last three or four weeks have as good a chance of survival as if they were born at

term, provided the nursing and hygienic surroundings are good. It is futile to lay down fixed rules based upon pelvic size as to the necessity of inducing labor.

I have seen a woman at term deliver herself spontaneously through a true conjugate of $6\frac{1}{4}$ cm., while, as we all know, there may be insuperable difficulty with a conjugate of $8\frac{1}{2}$ or 9 cm. Antepartum oetometry, the relative size of fetal head and maternal pelvis, the history of previous labors, the size of the parents, the diet of the mother and her muscular development must all be taken into account.

The following conclusions are justified from the experience of those of us who have given this method a trial in scores of cases over many years. Women with conjugatæ veræ in the neighborhood of 8 cm. can be delivered safely and easily during the last month of gestation who at term would require Cesarean section or pubiotomy, and a number of these women have been subjected to the major operations in previous labors.

The mortality of the premature infants is little, if any, greater than that of infants born at term in unobstructed labors.

Finally, it is a significant fact to be noted by the general physician who might study this discussion for his own guidance, that the warmest advocates for the induction of premature labor in cases of moderate contraction of the pelvis are those with the largest experience in the operation, while its bitterest opponents are those who have no personal experience with it at all.

The second proposition interests me more; viz., that there need be no dread of a Cesarean section after hours of labor pains, if the operative and aseptic technic is good. The importance of this statement is obvious. If, in doubtful cases, Cesarean section were always resorted to before labor we all know how many unnecessary operations would be performed. If a primipara is given twenty-four hours of labor and a multipara twelve, a safe limit within which rupture of the uterus need not be feared, about two-thirds of the women would deliver themselves spontaneously, who, if treated according to advice recently given the profession, would be subjected to an unnecessary major operation.

It has been my rule of practice for a number of years to test a doubtful case by a sufficiently long labor, and, in addition, often by a cautious application of the axis traction forceps for twenty minutes. Moreover, in my service in the University Hospital, many women are admitted after hours of labor and repeated examinations outside without aseptic precautions and, never-

theless, are successfully delivered by Cesarean section. My experience in this operation amounts to seventy-four cases.* In the last six years there have been thirty-five operations. The majority of them have been performed after twelve to twenty-four hours of labor. The only death was that of a woman operated on before labor.†

If the following rules of technic are observed I claim that Cesarean section is a safer operation than pubiotomy. Cleanse the vulva and vagina as carefully as though for a major vaginal operation. Pack the vagina with sterile gauze, cover the abdomen with rubber dam; deliver the uterus from the abdominal cavity; pack off the abdominal cavity with gauze packs. After evacuating the uterus, unite its walls with four interrupted suture of Pagenstecher thread, finest size; unite the myometrium with a double tier suture of chromicized gut, and the perimetrium with a double lace suture of catgut. Return the uterus to the abdominal cavity after the uterine operation is concluded and a toilet is made. If this technic is followed, Cesarean section is a comparatively safe operation at any stage of labor. In cases, however, of bad infection, such as those with gangrene of the vulva or sloughing of the vagina, the Parro operation can be done in the same way outside the abdominal cavity.

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The last paper in the symposium was read by Dr. A. LAPHORN SMITH, of Montreal, who said that two years ago he was opposed to Cesarean section, but his objection was only relative and not absolute, for as long as the operation had a higher mortality than the condition it was intended to relieve, he felt that it should only be resorted to in extreme cases. As soon as the technic had been so improved that there was almost no death-rate to it, he became an ardent convert. And now he had found out that the high death-rate which used to follow it was not due so much to the operation as to the delay in performing it. Any operation would have a high death-rate when performed on infected and dying women. But if Cesarean section was performed early enough and by an expert, it was the safest of all abdominal sections. Indeed, it might be called a benign operation, because it was free from the lacerations and bruises which were inevitable in the *accouchement forcé*, especially when the Bossi dilators were employed. These had a high death-rate from

*Since this was written, three more have been performed, making my personal experience seventy-seven operations, with one death among the last thirty-eight, and five deaths in all.

†She was not watched carefully enough by the nurse: on the second night she turned over on her face and abdomen, bringing the weight of her body on the recently sutured uterus which burst open.

lacerations and infection. With the modern Cesarean section there was neither of these causes of death. It was surprising how quickly it could be done; one or two strokes of the knife, and one was down to the uterus. An incision in the latter an inch long enabled one to put the two fore-fingers into it and to tear the incision up and down about six inches. The feet were caught and the whole ovum, placenta and all were quickly drawn out and handed to an assistant, who opened the membrane and tied the cord. All this took very little over a minute. With a good assistant to hold the two broad ligaments, there was very little bleeding, certainly not more, but rather less than was lost at an average normal labor. For convenience in sewing, the uterus could be lifted out and placed on a sterilized towel. The longest part of the operation was the sewing of the rent in the uterus with interrupted sutures. Although he employed this method in his three cases, he believed that a running catgut suture, only taking in the muscle, would hold the latter together, while another running suture of fine chromicized catgut would take care of the peritoneum. The mucuous membrane required no suturing. By this change in method of suturing the uterus the total time from the first incision to placing the last stitch could be easily reduced to less than thirty minutes. His cases took about forty minutes. The most remarkable thing about the Cesarean section was the well being of the woman afterward as compared with a forceps delivery. His two cases that recovered had absolutely no rise of temperature which they almost surely would have had if the child had been dragged through the vulva. He had long felt that the terms "milk leg" and "milk fever" should be abolished and called by their true name—puerperal infection or septic absorption through the more or less severe lacerations of a normal labor or the very severe ones of a forceps delivery. The woman who was delivered by Cesarean section before labor began was not only saved all pain, but was saved all this danger. His third case was a primipara. She felt so well the day after the operation that she assured him, again and again, that it was a shame to keep her in bed.

With regard to the child, he believed that it was more than a coincidence that it seemed to have neither pain nor ache enough to make it cry. The forceps had been and always would be an immense boon to women with moderate degrees of mechanical obstruction; but there was another and quite large class of cases, where the forceps inflicted upon the child severe injuries, the full extent of which was not yet recognized, being much more important than even the death of the infant.

The time was not far distant when women, who so nearly die at every confinement that their family physicians order them to separate from their husbands and thus break up their homes, may have such a safe and painless delivery by Cesarean section that they would cease to have the awful horror of becoming pregnant, which was becoming so widespread on this continent.

The author had previously pointed out that muscles which were not used underwent atrophy, and that even the bones to which these muscles were attached grew smaller. In other words the overeducated, underexercised woman, who thought and planned what others were to do, but did nothing herself, had a much more difficult task to drive the child through the smaller pelvis, with less muscular power to do the driving than her working sister. He also pointed out that such women married rich brain schemers and, if there was anything in heredity at all, these children would have larger heads than normal. If the child's head continued to increase in size and the pelvis of the mother to grow smaller and her muscular power weaker, a normal labor would become almost impossible. No substitute for normal labor could compare with Cesarean section. The pubic operations all had the defect of causing an incised wound in a place where it was difficult to keep it aseptic, while they did not do away with the bruising which usually accompanied a forceps delivery. After one had taken the risk of hemorrhage in a place where it was difficult to control, one still had the risk of bruising and tearing and infecting the soft parts. The cutting of the pubic bone or cartilage did nothing to make the passage through the soft parts less difficult. So that in all methods of artificial delivery at full term other than Cesarean section one had to reckon with injuries to the soft parts; that is, the cervix, vagina, perineum and sometimes the bladder. These injuries were known and recognized to some extent to be the cause of puerperal deaths, but their full extent had not yet been admitted. Many a woman had had her uterus washed out and curetted until she died, while the real cause was septic infection of tears of the vagina and perineum. Over and over again the writer had been called in consultation to see women who had been in furious labor for twenty-four hours and yet the head was not engaged. But the woman was exhausted and the situation intolerable to the patient, the family physician and the friends. Something had to be done and he did the best he knew in those days namely, put on the forceps and drag the head through. Often it required three people to hold the woman on the bed and two to pull on the instruments. The child was delivered, but generally dead. In some cases it lived, but with permanent injury to the brain. Sometimes it was necessary to perforate the head of the living healthy child—in plain English kill it—for no fault of its own, but just because its mother's pelvis was too small. To-day such treatment would be unjustifiable in a city or near a city where an expert could readily be found able and willing to do a Cesarean section and save both mother and child. Fortunately, these cases occurred rarely in the country where the woman worked and walked and married men with normal brains. Up to within the last year or two it had seemed less shocking to kill the child and almost kill the mother as long as delivery took place *per vias naturales* than to do a benign and gentle operation where skill and

speed had taken the place of brute force. But the time had come the writer thought, when the family physician should shrink from killing the helpless child as well as from making the mother run an unnecessary risk of her life and health.

It will depend upon him much more than upon the operator whether Cesarean section shall have absolutely no death-rate or not, for both of the lives were concerned according to whether they had both been seriously injured or not by forceful but futile attempts at instrumental delivery.

The discussion on this symposium was postponed until after the delivery of the PRESIDENT'S ADDRESS. (See page 1.)

GENERAL DISCUSSION ON INTRAPELVIC (SUBPUBIC) VS. ABDOMINAL METHOD OF DEALING WITH MECHANICAL OBSTRUCTION TO DELIVERY IN CASES OF CONFINEMENT.

DR. EDWARD P. DAVIS, of Philadelphia, said there was one point which was of common interest, and which had met with practically a common treatment. This referred to the examination of women before labor development. While the speakers agreed upon the necessity of that one point, still he desired to utter a word of warning as to the fact that it could not, at the present state of our knowledge, be accurate, and that we must not assign too much importance to the results of that examination. He believed in it fully, but we could not depend absolutely upon it. There was a large element of chance which could only be cleared up by the actual test of labor.

Proceeding to the patients, they might be divided into private patients, married patients in their own houses, and patients who came to hospitals. In married persons living in their own houses a preliminary examination before labor should lead to a consultation with husband and wife, or if the husband was not living, with the nearest responsible relative. The result of this consultation should be that the operator should lay before these persons frankly the dangers to be avoided and should give the husband and wife or family the results of modern methods, and especially the results of his personal work, and then say to them, What value will you place upon the life of the unborn child? It was not desired to place the mother at unnecessary risk, but it must be acknowledged that intrapelvic delivery offered greater risk to the fetus by the induction of labor through successive days, and that delivery by the elective Cesarean section offered to the child less risk than any other method. If, then, the mother was willing to consider the question of elective Cesarean section, as contrasted with intrapelvic delivery, in view of her desire for a child, she should have that privilege, and he had been led to that conclusion from actual experience with private patients. He had had a woman request the performance of Cesarean section, but had declined the request, and had delivered her three times successfully by the induction of labor and the use of

forceps. He had put the question before the husband and wife and had on two occasions Cesarean section requested, one after a consultation with Dr. Hirst and one after a consultation with another physician, and the family assumed entire responsibility. In both cases the induction of labor and Cesarean section results were perfectly satisfactory, there being no mortality and no morbidity. This, he believed, placed obstetrics upon a fair and dignified foundation and recognized the right of the husband and wife.

As to the hospital cases, there was a different situation. It had been abundantly proven in the hospitals of Germany that if the mother be asked whether any consideration shall be placed on the child, she would say no, except in these rare cases where the woman may be married and had lost children in previous labor and desired offspring. He did not mean to imply that German mothers were less loving than American mothers, but any unmarried woman would avoid risk to herself at the expense of the child. The surgeon must be in some sense the arbiter in the case, because he cannot suggest Cesarean section or pubiotomy to a young girl and expect acquiescence. She would demand that the child be removed from her. Remembering the fact that the unborn fetus is a potential factor, and may be delivered and brought to better development, we might allow this woman to go into the test of actual labor.

He called attention to what seemed a most serious objection to the skillful and successful methods of artificial dilatation of the cervix, in that they very often altered the mechanism of labor. They further did away with the moulding of the foetal head to a considerable extent, and is it not a fact that one of the most valuable methods and criterion for estimating the possible delivery of the child through the pelvis, is the moulding of the foetal head? If, now, it was intended to shorten by artificial dilatation the labor at the period of moulding, followed by the application of forceps, should we not have an increased foetal morbidity and mortality, and should we not have an increased risk to the mother by reason of the abnormality in the labor? The test of labor did away with this, and after a fair amount of labor pain the woman came to a practical demonstration that she could or could not be intrusted to bring the head of the fetus into the pelvic cavity whence it could be readily removed. He agreed with Dr. Hirst in the fact that the mortality from the Cesarean operation, after the woman had been some time in labor, need not be high. He had had forty-three Cesarean operations upon women who had not been subjected to forceps or efforts at version, but who had been for some time in labor, and some of these women had labor induced with the hope of avoiding section. Of this number of operations there was one maternal death but no foetal mortality.

So far as the question of induction of labor was concerned, it undoubtedly lessened the maternal mortality.

DR. F. PFANNENSTEIL, of Kiel, Germany confined his remarks largely to the consideration of contracted pelves. Hebostiotomy or pubiotomy was not looked upon with the same favor in America as in Germany. However, he was an advocate of this operation in certain cases. Cesarean section and the induction of premature labor had their special indications. One should differentiate the cases and perform that operation which was indicated in the particular case. Cesarean section and hebostiotomy were operations that should be done by specialists and reserved largely for hospital cases. Generally speaking, Cesarean section was indicated in cases of contracted pelvis.

DR. HENRY D. FRY, of Washington, D. C., said that a large number of women who entered the hospital in Washington, particularly colored women, had small pelves. In nearly half of the white women and in nearly half of the colored women the external measurements were below normal. These measurements indicated that contracted pelves existed in 49 per cent. of all colored women, and in 25 per cent. of white women, whereas the measurements which simply indicated contracted pelvis was 20 per cent. in the whites and only 5 in the colored. Fully two-thirds of these cases were delivered naturally. In a large number of instances, where the external measurements would seem to indicate a diminished pelvic space, the diameter of the conjugate would be found normal. Nature took care of these women, and where they had contracted pelves they had small babies, and in proportion to the decrease in the size of the conjugate the babies got smaller and smaller. In some 400 examinations, where the external conjugate measured between 19 and 20 cm. the babies weighed seven pounds and ten ounces and gradually got smaller and smaller as the external conjugate diminished, and when the diameter of the external conjugate was between sixteen and seventeen cm., the average weight of the babies was six pounds and four ounces. Fully two-thirds of these women were delivered spontaneously. At the Columbia hospital, where they had a number of these cases, until recently high forceps was used a great deal. The maternal mortality was almost *nil*. But they lost, however, one-third of the babies. In the last twenty high-forceps operations there were seven dead babies. In these cases they had begun to use now the elective Cesarean section and out of sixteen babies that were viable fifteen were born alive. The induction of premature labor was receiving with him personally less and less attention. This spring he tried it on two cases, with failure in both.

In regard to symphysiotomy and pubiotomy, a great many obstetricians did not favor them, believing there was very little or no place for them. He could not agree with that position, because he believed there was a place for both of these operations.

DR. CHARLES JEWETT, of Brooklyn, N. Y., said the principal objection to the induction of premature labor was the high mortality to the child, and there was some mortality to the mother. He did

not think enough distinction was made between different degrees of prematurity in cases in which the child could be delivered in the last two or three weeks when the pelvic contraction was very slight. The results to the child by induced labor were better than by the disjunction of the pelvic ring, and almost as good as by Cesarean section, and better for the mother. He was in sympathy with those who partially condemned the pelvic-splitting operations. The after-care was extremely unsatisfactory; the degree of traumatism was very great, and the after-condition of the mother was frequently bad.

With reference to the choice between the two operations, symphysiotomy and pubiotomy, there was very little advantage in symphysiotomy over pubiotomy. It was claimed and it was doubtless true, that the danger of infection was less from cutting through the bone than from dividing the soft structures, dividing the end of the pubic disk, but this advantage was counterbalanced by the great frequency with which these patients had crural phlebitis.

DR. AUGUST MARTIN, of Germany, said he had listened to the series of papers with great interest, and wished to say that if we followed the development of these various operations for delivering children, we would see with Max Sänger that the classical Cesarean section was limited to a small number of indications. When Morisani revived symphysiotomy it was energetically defended by French collaborators, by Schauta, Zweifel and others. The results of symphysiotomy alone were not as satisfactory as they might be, and then Professor Gigli advocated symphysiotomy and pubiotomy. All of these operations were advocated, according to the indications, to save living children from perforation, but it must be remembered that these operations were proposed for aseptic cases, whereas in septic cases and in greatly contracted pelvis perforation was practiced. Not long since Fritz Frank, of Cologne, proposed another kind of abdominal incision with a view to protecting or saving the peritoneum, which incision had been modified by Sellheim, who proposed to make an opening above the symphysis and take off the peritoneum of the bladder, separating the bladder downward from the cervix uteri, but incising it in the median line without, in many instances incising the body of the uterus. If the speaker was able to see the course of these various operations, he felt that sooner or later we would return to the classical Cesarean operation and direct attention toward finding out a method of saving the peritoneum.

With regard to symphysiotomy and hebostiotomy, referred to by Professor Pfannensteil, they were more difficult and required great skill on the part of the operator and should not be undertaken by the average general practitioner in the country.

DR. EDWIN B. CRAGIN, of New York, spoke a word or two in favor of the induction of premature labor. He should not know how to practice obstetrics in New York unless he could avail himself of the induction of labor in the minor grades of contracted

pelves. He believed in the test of labor. He did not believe in doing a Cesarean section until Nature had shown what she could do with the fetal head, and in cases in which Nature had almost succeeded without the assistance of the accoucheur, it seemed to him that at the subsequent labor the induction of premature labor at two or three weeks ahead of term probably would solve the problem successfully.

In regard to Cesarean section, after a trial of labor, he was not quite willing to resort to this operation except where the indications were positive, without letting Nature show what she could do. He was averse to using bags in the cervix and in the vagina; if he expected to do Cesarean section, he wanted the cervix and vagina as untouched as possible. He wanted the vulva thoroughly sterilized and kept covered with a sterile dressing. Therefore, he would feel uneasy if he were obliged to do a Cesarean section after he had had an elastic bag in the cervix and vagina.

As to vaginal Cesarean section, he had done quite a number of them, and yet the operation impressed him as not being an easy one. The upper angle of the uterine wound in his experience was not always an easy one to close. The ease with which one could do an abdominal Cesarean section, with everything before his eyes, as contrasted with vaginal Cesarean section, with the upper angle of the uterine wound hard to reach, did not speak in his experience of vaginal Cesarean section as an easy operative procedure, and he thought it was a mistake for the general practitioner or the nonspecialist to do vaginal Cesarean sections expecting them to be easy operations.

In regard to pubiotomy and symphysiotomy, he agreed with Dr. Jewett that the field for them was narrow, and would become narrower and narrower as the years went by.

DR. ROBERT A. MURRAY, of New York, desired to speak, first, in regard to the teaching of obstetrics. Most of the statistics of the major operations had been gathered in hospitals. The majority of patients were not confined in hospitals, but outside of them. He was glad Dr. Davis brought that point forward. There was a difference between a private patient and one in a hospital. The private patient was usually under the care of the obstetrician before the approach of confinement and kept under observation so as to determine the condition of toxemia by analyses of the urine, the condition of the pelvis, etc. In the hospital case this was not done in the majority of instances, and the obstetrician had the choice of only a few operations. In the eighth month, or before that, when observation is made of the urine to determine toxemia, the physician should absolutely determine whether the head is compressible in the pelvis and what degree of solidity there was in the suture.

Next, he believed that with skilled assistants and with the skill which the members of the society possessed, Cesarean section was far more preferable to the surgeon than any other

method of delivery. It was easier than many normal labors. It meant less care on the part of the surgeon. It meant less time. He made a plea for version and forceps in the third stage, as both of them had stood well in the past, and it was a mistake to advise the general practitioner against not trying them, but to resort to Cesarean section because it was easier. He did not think any of the members would want the abdomen of a relative opened to extract a child if there was any possibility of delivering it by the natural passages. There was still a large field for the induction of premature labor. Cesarean section as an operation would hold its own in cases of contracted pelvis, and where the pelvic bones were absolutely fixed. He did not think that in such cases pubiotomy, or any operation on the pubis, would be as effectual as Cesarean section.

DR. MALCOLM McLEAN, of New York, referred to the great impatience of the age. He did not know how it was in Germany, but in America everything must be done in a hurry. A woman must have a baby within two hours. She must not go through the normal changes which are requisite to conduct her through a normal delivery. A great number of practitioners were making mistakes and bringing ill repute upon such operations as had stood well by scientific men, as, for instance, the use of forceps and version in proper cases, because of their imperfect training and imperfectly putting into practice the things that were taught them in medical schools. Instances were cited of practitioners who did not conform to the principles of obstetrics as taught them. The violation of propriety in obstetric operations was still going on. It would be difficult to convince the speaker that version should be laid aside, when he had been so successful with this method. He made a plea for the maintenance of a normal operation through normal passages, so far as possible.

DR. CHARLES M. GREEN, of Boston, sympathized with what Dr. McLean had said. He disliked to hear the statement made that high forceps and version were going out of use simply because under improved modern methods Cesarean section was such a safe operation. Those operations had not been overlooked in the teaching in his own school, and they took a great deal of pains in teaching the operation of forceps and version and of teaching the election of these operations and which operation should be the choice. They took pains in teaching pelvimetry and in teaching the estimation of the size of the child. There were three factors concerned in the safe passage of the child through the pelvis. It was not alone the passenger, nor the passage, but we had to consider the power that was going to push the passenger through the passage, and this, of course, was often impossible to determine. In a woman who had had no previous obstetric history, where there were no data to go by, they endeavored to determine with reasonable probability whether the woman could be successfully delivered or deliver herself through the natural passages, and if it was not thought

there was a reasonable chance of this, then the patient was not touched, and there were many cases in which patients were not allowed to go into labor at all, but were delivered by the classical Cesarean section before any labor pains occurred. If, on the other hand, he had to deal with a border-line case, then he had not been able to see any reason why such a woman should not be allowed to have the test of labor for a reasonable time, carefully abstaining from vaginal examination, and from all possible infection of the patient, and then, if within a reasonable time the patient was not able to bring the head down, to proceed to the classical Cesarean section. Speaking for himself and his associates on the hospital staff, they did not believe in symphysiotomy or pubiotomy. They thought they could do better by delivering these women by means of Cesarean section.

DR. E. W. CUSHING, of Boston, said that in some cases, where a woman was brought into the hospital presumably infected, the child alive, and the question arose as to whether a Cesarean section should be done or not, much good could be derived from the intelligent use of vaccines as now prepared. For instance, in his hospital several months ago a woman was brought in who had been worked over by five doctors for twelve hours, applying forceps with rudimentary precautions or none at all, and rather than lose the child Cesarean section was performed. At the same time, Dr. Leary took a culture from the cervix uteri. The woman had a bad chill, with a temperature of 105° . This culture was bred and found to contain colon bacilli, but no streptococci. Vaccines were given, shortly after which the temperature declined and the woman recovered. He believed her recovery was due to the administration of the vaccines.

He could mention many cases that had come under his observation where Casarean section was not necessary, but where the children had been finally delivered with forceps and the temperature of the patients controlled by the use of vaccine, the women subsequently going on to a good recovery.

DR. A. LAPHORN SMITH, of Montreal, had tried to induce women with contracted pelves to diet themselves in order to have small babies, but this failed. After a woman was delivered of a baby she soon forgot about her troubles. When a woman was in labor, if such a labor was going to require Cesarean section, she was in no condition to dictate what should be done nor were the members of the family in a position to do so. Most of them would say, "Doctor we know nothing about it. You must decide." This was the position obstetricians should take. It was hard enough for the obstetrician himself to decide, with the help of his *confrères*, as to the proper course to pursue. If it was borne in mind that Cesarean section had little or no mortality to the mother and child, then most women would be inclined to let the obstetrician perform that operation when he thought it was necessary.

DR. GRANDIN, in closing the discussion on his part, said he

would rather resort to version than to Cesarean section. He contended that high forceps could never be made the operation of election, and that where cutting operations were refused by the parents who had the right under the law of this land to elect, he preferred version.

DR. EDWARD REYNOLDS, in closing the discussion on his part, said he believed that the elective Cesarean section was likely in the future to occupy a more and more prominent place in obstetric practice. He thought the members were wise in going slowly. Of the doubtful cases that came to him for opinion, he had recommended against the induction of labor and for Cesarean section in about an even proportion of cases. He was far from believing that there was nothing in the induction of labor. He thought there were doubtful cases where it was wise to let pregnancy go beyond, or perhaps quite to term, with soft fetal heads, which might become hard, before interfering; but he believed profoundly that whether we were going to do intrapelvic or abdominal operations, the fight for the induction of labor at eight months or earlier, in cases of marked deformity of the pelvis, was a losing fight. Early induction of labor in any but the most doubtful cases was a by-gone.

DR. RICHARD C. NORRIS, in closing the discussion, said he was glad to see that when such questions came before the society the common sense of its members reached a safe and middle ground. The tendency of the thoughtless and overzealous application of the Cesarean operation by men less expert than the members made it harmful to the general profession. This discussion would check that tendency. It had been brought out clearly that men had not wholly abandoned the older ideas of obstetrics; that obstetrics was not in danger of losing itself as a specialty of gynecology, but applying its principles to practice would add new laurels to the victories already achieved. There was apparently a general agreement as to the useful field of induction of labor in minor grades of pelvic deformity. The limitations of forceps and version were being defined, and the indications for performing Cesarean section made clear to the general practitioner. He agreed with Laphorn Smith that these problems could not be settled by the patient or by members of the patient's family. The obstetrician, after reaching his own conclusion that such a plan of procedure was the best, should expect the family to follow his advice. If the family disagreed with a proposed operation, and the physician's judgment fell to the ground, he was left in the lurch, which was not a comfortable predicament. Cesarean section was the operation of choice to the skilled gynecologist, but pubiotomy would have a place. Its limitations, however, must be defined and learned.

(To be continued.)

REVIEWS.

LECTURES ON GENERAL OBSTETRICS. By DR. HEINRICH BAYER, Extraordinary Professor at the Kaiser Wilhelm University, Strassburg, Germany. Strassburg, Schlesier und Schweikhardt, 1908.

Five to six years' practice in a special line seems to be sufficient nowadays to enable a man to write a text-book. Provided it is abundantly illustrated, the book will sell. Many readers do not discriminate whose experience they get. We have to admit that some of our text-books are mere primers made up for the memorizing student. How vastly different is the book reviewed in this abstract! The product of twenty years of painstaking histological research and large clinical practice, it gives us an account of all of the original work that Bayer, who is well known in German literature has done from the time of his internship up to the official position he occupies now at the University of Strassburg. Such a book—the work of a lifetime—is something unique in our materialistic days.

It is arranged in lectures and, we might say right here, in the old style of academical lectures, but in such an easy and interesting language that even the men who are not very well versed in German can read it with ease. The whole work contains seven parts, treating the doctrine of evolution, the anatomy and physiology of the female generative organs, labor, puerperium and its therapeutics. The first two chapters appeared some time ago. The third part (just issued) is a book of 527 pages, with ten tables and 63 illustrations in the text, and deals with the development and anatomy of the female sexual organs.

Bayer says in the preface to his book that he did not intend to write a picture-book, but a scientific book. Everybody will have to concede to the author that his book is written from a thoroughly objective point of view. The pictures given in the text elucidate the comparative anatomy and those on the plates are worthy objects of comparison for those intending to take up similar work. They are masterly reproductions of specimens from the author's collection which have been reduced after photographing. They are executed in such a perfect way that one has to use the magnifying glass in order to recognize the fine details of the structure.

Reading such a book born of thorough knowledge of the literature and personal research, one cannot help drawing comparisons with the product of modern divided work, the so-called hand-books. Written by one or two dozen authors who strive to place their own more or less personal views before the profession, these complete hand-books discuss some matters twice,

while many important facts and questions are not mentioned at all. How different is Bayer's book—the life-work of one man! It is planned in such a grand way that one cannot help wondering whether one man's strength and life is sufficient to complete it. This personal element in the discussion of a large discipline renders Bayer's book attractive; in fact, places it high above all the modern specialistic literature.

The whole work breathes a teleological consideration of the matter in hand. Bayer, however, does not get lost in the mysteries of the final causes or original source of life. On the contrary, the understanding of all anatomical arrangements of the human body is hereby facilitated. This becomes evident in the chapter treating the menstruation and ovulation. Although comparative anatomy and evolution are amply considered, the practising obstetrician is evident everywhere. For instance, in describing the muscles of the pelvis, the author justly calls our attention to the purposeful arrangement of the openings in the bones, the appropriate course of the muscles filling out these openings during labor proper. It is not dry anatomy we are reading, but a physiological description of the anatomical conditions discussed by a learned and observant obstetrician.

The muscles of the uterus and its blood-supply are described in a masterly way. In contrast to the commonly accepted view of the ligaments as an outgrowth of the uterine muscles, Bayer believes in an independent ingrowing of the ligaments into the uterus. Menstruation and ovulation and their connection are treated beautifully and very clearly. The author explains his own teleologic conceptions of menstruation, in opposition to the atavistic doctrine promulgated by Johannes Mueller and Gebhard, who regarded menstruation merely as a periodical regeneration of the uterine mucosa. His examinations prove that the surface epithelium loses its cilia during menstruation. This, of course, would enable the spermatozoa to enter the uterus.

Bayer, who published several articles about impregnation and sex formation, is certainly the man to do justice to a question as difficult as that of the formation of sex. This, as well as the secondary sexual characters, are treated in a thorough and most up-to-date manner. That the author never loses an opportunity to point out the many deficiencies in our knowledge, must also be highly appreciated. Many a young obstetrician will thus find a new route for research-work. Those among us, to use Bayer's words, who regard the uterus mainly as a part of the human body especially fit for being cauterized, scraped and extirpated, pass with closed eyes the great miracle of life which the uterus still forms. For those this book is not written. They who have any desire for knowledge left will, while reading it, feel inspired to join the all too small number of research-workers.

Through the whole book breathes the noble spirit of a scholar

who devoted his whole life to research into the many problems we are confronted with in impregnation, pregnancy and labor. German and foreign literature are fully considered, which makes Bayer's work a first-class reference-book. G. S.

AN INDEX OF TREATMENT. By various writers. Edited by ROBERT HUTCHISON, M. D., F. R. C. P., Physician to the London Hospital and Assistant Physician to the Hospital for Sick Children in Great Ormond Street, and H. STANSFIELD COLLIER, F. R. C. S., Surgeon to St. Mary's Hospital; Joint Lecturer in Surgery in St. Mary's Hospital School; Surgeon to the Hospital for Sick Children in Great Ormond Street. Revised to conform to American usage by WARREN COLEMAN, M. D., Professor of Clinical Medicine and Instructor in Therapeutics in Cornell University Medical College; Assistant Visiting Physician to Bellevue Hospital, New York, New York: William Wood & Co. 1908. 888 pages.

With the exception of one German author, Schmieden, who has written the chapter on Passive Hyperemia, this book is written entirely by English authors. That the editors have spared no pains in the selection of writers is shown in the presence of such names as Allbut, Bramwell, Gibson, Hunter, Oliver, Poynton, Saundby, Eustace Smith, etc., in the list of contributors. Inasmuch as the book is intended for practitioners, detailed descriptions of major operations have been omitted, while the nonoperative methods of treatment are more fully elaborated. The more important gynecological diseases are discussed, but the therapy of obstetrics has been practically excluded. The work of the American editor has been confined almost entirely to the adaptation of English prescriptions to the United States Pharmacopeia (wherever this is possible) and to the substitution of the names of American manufacturers, in certain instances, instead of English. In order to furnish the American reader knowledge of British pharmacopeial preparations, an appendix has been added containing brief descriptions of such preparations.

It is only natural, in a work presenting such a multitude of data, to except differences of opinion in regard to therapy, but on the whole, such differences are remarkably few and of not vast importance. Perhaps the weightiest objection we have, is a tendency, in certain instances, toward polypharmacy, at the expense of hygienic and dietetic measures. No objection whatever can be raised against any of the gynecological methods advised.

A work of this character, in order to attain its fullest value, must be as complete as possible. This, however, is by no means the case in regard to the volume before us. Indeed, the editors fully realize this, and invite suggestions of such omissions as occur to the reader. Among the more important omissions that we have noted, we suggest the following: the

open method of administering ether; the value of stomach washing for vomiting after anesthesia; vaccination; infant feeding; operative treatment of exophthalmic goitre; coccygodinia; rickets; myositis; carcinoma of the colon; osteomalacia; acute yellow atrophy; the treatment of Hodgkin's disease by injections of arsenic; lymphangitis; adiposis dolorosa; tenosynovitis and synovitis; and gangrene and abscess of the lung.

This book should prove of much value as a ready reference hand-book to practitioners; and we believe that the inclusion of the above omissions should enhance the value of the next edition considerably.

E. M.

PRINCIPLES AND PRACTICE OF HYDROTHERAPY. A Guide to the Application of Water in Disease for Students and Practitioners of Medicine. By SIMON BARUCH, M. D., Professor of Hydrotherapy in Columbia University (College of Physicians and Surgeons), New York; Medical Director of the Hydriatic Department of the Riverside Association; Consulting Physician to the J. Hood Wright Memorial Hospital, etc. Third Edition, Revised and Enlarged. 544 pages, with numerous illustrations. New York: William Wood and Company. 1908.

Since the appearance of the preceding edition of this work, the importance of the subject of hydrotherapy and the work of its author have both received recognition through his appointment to the newly-established chair of hydrotherapy in the College of Physicians and Surgeons of Columbia University. Its writer is the recognized leader in the subject in this country and his book occupies the same place in American medical literature. Since the value of hydrotherapy is becoming recognized, the coming generations of medical students will emerge with this addition to their therapeutic armamentarium. Study of such a work as that under consideration furnishes the only means by which those who have not had such advantages may keep abreast of the times. As in the preceding editions, the volume contains a large number of case reports inserted for the purpose of illustrating the adaptation of hydriatic procedures to the individual patient and condition. The most extensive revision has been in the chapters on tuberculosis and insanity.

H. D.

DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS. By FRANCIS M. POTTENGER, A. M., M. D., Medical Director of the Pottenger Sanatorium for Diseases of the Lungs and Throat, Monrovia, Cal.; Professor of Clinical Medicine, University of Southern California. 377 pages. New York. William Wood and Company. 1908.

A work the size of this volume, devoted entirely to the diagnosis and treatment of tuberculosis of the lungs, serves to emphasize the overwhelming importance of this disease—the greatest foe of mankind. It opens with a description of the early symp-

toms and diagnosis, including a discussion of the distinction between human and bovine bacilli and the resulting infections. The writer discusses also the possible dangers in the use of tuberculin and the technic of its administration for diagnostic purposes. Advanced tuberculosis is next considered. Under physical signs, particular stress is laid upon various methods of percussion. Prognosis and prophylaxis are treated briefly. The greater part of the volume is devoted to treatment. This is based upon attempts to bring about immunity by endeavoring to restore the natural resisting power of the patient (fresh air, diet, etc.) or by artificially stimulating the body cells to the production of more specific protective substances (vaccination, tuberculin, injections) or by supplying to the organism specific protective substances which have been produced by vaccinating some animal (antitoxic sera); measures which bring a greater amount of specific antibodies in contact with the bacilli by causing an increased local flow of blood or lymph (Bier's hyperemia, etc.); remedies which relieve symptoms; those directed against mixed infection. Each of these classes of treatment is fully discussed. The author advocates sanatorium treatment for advanced as well as incipient cases, and describes his own institution. While acknowledging the value of climate in the treatment of tuberculosis, he urges the greater necessity of intelligent guidance of the patient and the importance of financial independence on the part of a patient who wishes to leave his home to seek health among strangers. The effects of altitude, humidity, temperature and sunlight are considered. Tuberculin is advocated for the treatment of complications as well as of pulmonary involvement. The treatment of symptoms is rationally presented. Perhaps the most important sentence in the volume is the statement "that if medical men would expend but a fraction of the energy in learning to diagnose tuberculosis early that a few scientists are expending in endeavoring to discover a 'cure' for it, we would be able to say that the cure for tuberculosis is already at hand." In an appendix the writer reprints former publications on state sanatoria, a study of tuberculous infection, culture products in the treatment of tuberculosis, and a critical study of tuberculin and allied products based upon a collective investigation. The volume is worthy of perusal and of a permanent place on the practitioner's shelf.

H. D.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

HYGIENE OF THE EYE IN SCHOOL CHILDREN.

BY

W. M. CARHART, M. D.,

New York City.

Assistant Attending Surgeon Manhattan Eye, Ear, Nose and Throat Hospital.

PATIENTS frequently ask the oculist why it is that more people are apparently requiring the aid of glasses now than was the case thirty or forty years ago. The answer to this question involves a number of considerations, but the main reason for the greater use of glasses is that our eyes are now put under a considerably greater strain by their more extended use for close work. In the days of our grandfathers there was no such strain put upon the eyes as is now the custom, where almost everybody reads the morning and evening papers and where life in cities confines the vision of inhabitants to a close range. We are using our eyes for writing and reading to a considerably greater extent now than before, and hence we are needing to wear glasses not only earlier than formerly, but more constantly.

This use of glasses is by no means to be deplored. On the contrary, they are a benefit to modern life. It is not true, in my opinion, that the eyes of most people are any weaker or more near-sighted than the eyes of our ancestors, but our ancestors did not have such urgent need for perfect sight. This demand for aid in vision has led the medical profession to give more careful attention to the examination of the eye than was necessary in the former times, and it therefore follows that we as oculists are finding very many more defective eyes than were found by the general practitioners in the days when there were no specialists of the eye.

The hygiene of the eye is particularly important in these days for school children, not only because they are the hope of the future, but because the demands of modern civilization have increased the course of study in schools, both public and private, to such an extent that the eyes of children are now used under

very perilous conditions. In the old days of the district school-house the greater part of the instruction was conducted orally, and there was little or no writing from dictation. Now a great deal of the instruction is dictated, both for the convenience of the teacher and for the saving of time, and the child must write this dictation under some pressure. Also, the multitude of subjects required in school life puts a considerable amount of haste in study upon the child in school hours. When in addition books are brought home, and the next day's lessons are prepared under artificial light around the table where the light is often directly glaring into the child's face, there is imposed an excessive strain upon tired eyes with considerable danger of irritation leading to inflammatory trouble.

We are now sending our children at an early age to the kindergarten. This rather fashionable practice is supposed to be the acme of advance in child culture, but it also has its own great dangers to the child and particularly to the child's eyesight. Where a young child of three or four years old is put to stringing beads or to making pictures out of cardboard by threading colored worsted through minute holes in the cardboard, the immature eyes of the child are put upon an altogether unwarrantable strain of accommodation. Every child whose eyes are normal is born far-sighted, and for such a child the accommodation, while active enough at an early age, should not be unduly stimulated in this way, for the reason that the muscular strain of accommodation tends to distort the eyeball into an elongated shape and to cause such pressure upon the cornea as results in astigmatism. The eye of a child five years old is in an unformed and plastic state, and any strain acting upon it has vastly greater effect for harm than later on in life when the eye has gained its permanent shape.

To send a child to kindergarten when it is restless and hard to amuse may be a relief to the parents at home, but it is of very doubtful advantage when the relief is purchased at the price of permanent ocular injury. These very young children, if taught at all in kindergarten and day nurseries, should be occupied and amused by the use of pictures or charts placed at a considerable distance from the child, and all near work for any length of time should be utterly discouraged. This particularly applies to sewing, which seems to be one of the first things that is taught. So far as the eyes are concerned close work for a considerable period should not be commenced until the child is eight or ten years old, and therefore all kindergarten or primary work

should be conducted at a range which absolutely prevents strain on the accommodation.

Systematic study is safe only after the ocular tissues have become well formed, and have passed out of what I have called the plastic stage of development. The child will, in my estimation, not lose anything in either knowledge or experience by this apparent delay in its education. Not only will the eyes of the child at ten years old be able to bear with safety a greater amount of work, but the child's brain will be in better condition to assimilate knowledge than if such knowledge were forced upon it at an immature age. A child beginning serious study at ten years old will at fifteen be not only in better health and have stronger eyes, but will actually be further advanced in knowledge than if it had been forced to commence book study at six or seven.

Astigmatism is largely acquired from eye strain in early years. The normal eye of the new-born child is neither myopic nor astigmatic. An abnormal eye may be at birth either myopic or astigmatic or both, but the natural refraction of a child's eye at birth is hypermetropia without astigmatism. It is true that the great majority of patients consulting an oculist for eyestrain, have more or less astigmatism, but my firm belief is that this astigmatism has usually been acquired in the early years of life from the stress of eyestrain.

Many parents are doing an utterly wrong thing in encouraging a child to enter competitions in school life and in applauding the ambitious efforts of the child to outstrip its fellows. It is the ambitious child who is in more danger of harming its eyes than the sluggish child, and the child who suffers from subsequent eye disease is often the child with fairly normal eyes who uses these eyes to excess, rather than the child with markedly defective eye-sight. Children are often allowed, in addition to their school work, to read books at night and to take extra lessons in music or other accomplishments which add to excessive strain. The far-sighted child can bear close work less easily than the child with the defective vision which accompanies myopia, and it is the astigmatic child who has the severest headaches and the most asthenopic symptoms. Wherever a child is found to have constant headaches during and after school work, that child is surely harming the eyes by its effort at study. The near-sighted child does not usually suffer from headaches, but excessive application is quite as harmful in that it is apt to increase the amount of myopia.

Numerous school statistics show that the percentages of myopia and of astigmatism increase from year to year as the child advances from lower to upper grades. Not only does the percentage of both myopia and astigmatism increase, but as the higher grades are entered, the child shows an astigmatism of a higher amount, and the myopia becomes progressively greater, both of these showing a constant increase in the damage done to the eye by the strain of school work. Many statistics have proved these facts to be true in a marked degree of all schools, not only those in cities, but those in suburban towns as well. In the larger cities and particularly in New York, the reforms instituted for medical school inspection have led to a recognition of these dangers to the eyes of children. Superintendent of Schools Maxwell has lately been urging provision to be made for the furnishing of glasses to the children in the New York public schools, unable to procure them for themselves. There is now an excellent medical school inspection in charge of the Department of Health, but up to the present there has been little provision made by the city itself for the correction of eyestrain in school children. When the medical inspector has discovered in his examination symptoms of eyestrain, all that he can do at present is to send a card to the child's parents stating that the child is probably suffering from refractive error and to advise it to be taken either to the family physician or to some clinic for the eye. Many of these cases among the very poor of course never turn up at any clinic, nor is their refraction corrected by their private physician. Superintendent Maxwell's idea, so far as it is known to me, is that the city should make some provision through the Department of Health and Board of Education for the examination of the sight of the school children where found defective, and for the furnishing of the proper glasses in cases too poor to buy them for themselves.

Undoubtedly many children are backward in their studies from inability to concentrate their attention on their books because of visual defects. Such cases will quickly respond to the aid of correction of refractive error by increased mental concentration and increased power of acquiring knowledge.

SUMMARY.

1. The increase of late years in the number of children wearing glasses is not due to an increase in the number of weak or diseased eyes so much as it is due to the greater strain upon the

function of vision necessitated by our more extended use of the eyes for close work in the complex civilization of the present day.

2. The normal child is born hypermetropic and without astigmatism. The myopic child is either defective from birth or has acquired myopia from the stress of eyestrain, usually through the "turn-stile of astigmatism." Astigmatism is not congenital, but is practically always acquired in the normal child during the early years of life by excessive strain upon the muscles of accommodation.

3. Kindergarten and primary work should be arranged so as to avoid strain upon the muscles of accommodation of the eye in the plastic years of childhood. Hence, sewing and all weaving exercises should be limited in amount, if not absolutely eliminated.

4. Systematic study should be only begun when the delicate and soft tissues of the child's eyes have attained sufficient formation to resist distortion on moderate use of the accommodation. This means, in my estimation, that prolonged close work should not be allowed until the age of ten or over. A child beginning systematic study at that age will, with suitable care, be able at sixteen or eighteen to acquire all the knowledge possible to its more precocious companion, and will have the inestimable advantages of normal eyes and healthy physique.

5. No young child should be encouraged to compete with its companions for prizes. Mental and ocular overstrain are the inevitable results of such educational monstrosities. In the primary schools especially there should be no grading of the children.

6. A child incapable of the prolonged use of the eyes at the proper age should not be classed as culpably lazy. In the majority of cases there will be found uncorrected refractive error.

7. Inability to concentrate the mental attention, and deficient powers of observation are often caused by bad visual memory resulting from eyestrain.

8. The symptoms and physical signs of eyestrain in children can be easily recognized, and there is no more brilliant success in medicine than follows the correction in children of refractive error. Ocular hygiene is all important in preventing educational overstrain.

RECENT STUDIES ON SCARLET FEVER.*

BY

ANNA W. WILLIAMS, M. D.,

New York City.

STUDIES on scarlet fever have been carried on intermittently at the Research Laboratory of the Health Department for the last five years. Our opportunities for the study of this second most common acute infectious disease have steadily increased in the past few years and they are now exceptional. With an immense hospital at our door, full of patients, with an expert hospital staff ready to execute our orders, practically the only drawbacks in our work are the inability to obtain autopsies when death occurs during the active stages of the disease, and the fact that, so far as we know, man is the only animal susceptible to the disease; and hence we are unable to test our findings on experimental animals. The experiments on monkeys as yet have been too few for us to draw any conclusions as to the complete non-susceptibility of these animals.

During the past year we have had in our contagious disease hospitals a great increase (about 200 per cent.) in the number of cases of scarlet fever, as the following figures showing the number of cases in each hospital on the same day of the month for this year and the previous year will indicate:

Willard Parker Hospital,	Mar. 31, 1907.	136 cases	1908	425 cases
Kingston Avenue Hospital,	Apr. 6, 1907.	110 cases	1908	208 cases
Riverside Hospital,	Apr. 6, 1907.	32 cases	1908	147 cases
	Total,	<u>278</u>	<u>'08</u>	<u>780</u>

This increase is thought to be not chiefly the evidence of an epidemic, but rather it is supposed to be due to the increase in population, though overcrowding is an important factor in the spread of the disease.

Eighty-five per cent. of the cases at Kingston Avenue last year came from certain newly settled over-crowded districts. The statistics for the other hospitals on this point are not yet complete. Whatever the reason the fact remains that scarlet fever has been for some time very prevalent, which makes research work in regard to it more than ever the duty of health departments.

An interesting point in regard to the cases occurring for a year back, is that the great majority of them have been of the moder-

* Read before the Women's Medical Assoc., of N. Y. C., April 15, 1908.

ately severe type with marked streptococcaemic sequelæ, deaths occurring late and apparently as a result of the secondary lesions. The total death rate has been about 7 per cent.

Notwithstanding the fact that this disease has been recognized as an entity since the time of Sydenham (1685) and that there is a lengthy bibliography in regard to it, we really possess comparatively little definite knowledge of it. This is due in great measure to the lack of careful observations and of minute records. Even from a clinical standpoint we are still in doubt in regard to many points.

In the first place, we do not know definitely the chief site of the virus, and hence the chief source of infection. By many the skin has been considered the most dangerous element in carrying the disease to others, but in no one instance cited in favor of this view can certain other sources of infection be ruled out. These other sources which are now considered the chief, if not the only ones are the exudates from throat, nose and ear. The great majority of the so-called "return" cases, according to recent statistics, are thought to be due to infective material contained in such exudates. In order to be certain of this, the most careful oversight of discharged hospital cases should be carried on for some time after their return home, since a fresh attack of exudative inflammation in an apparently cleared up case of recent scarlet fever is supposed to start up the development of remnants of quiescent scarlet fever virus.

Our discharged cases are now being kept sight of, as far as possible, with the idea of solving this problem.

We do not know in the second place how long the virus may remain infective when separated from the patient. The most extravagant tales are told of infection from exposed articles after twenty years rest in a trunk.

We do not know, in the third place, the exact period of incubation in this disease. The majority of authors think that the first symptoms may show any time from twenty-four hours to four weeks after exposure, while some recent good observers say that in all cases recorded as developing under four days, the possibility of an earlier exposure cannot be ruled out, and that the mean time of the different observers—twelve to fourteen days approximately—is probably the time period of incubation in this disease.

In the fourth place, only one of the many symptoms described is supposed to be pathognomonic. The rash is not character-

istic, for we may obtain a perfectly typical scarlet eruption after inoculation of antitoxic or normal serum.

Desquamation may occur after any erythema; similar throat symptoms appear in ordinary tonsillitis.

The one symptom said by some to be pathognomonic is the enlargement of the papillæ at the tip and sides of the tongue, and even this is sometimes so slight that it is difficult to make out and this has been reported as occurring in other diseases.

The complex of symptoms is said to be characteristic in the majority of cases, but still many cases occur on the border line between measles and scarlet fever and there has been much discussion over the "Fourth disease of Duke" without arriving at a positive conclusion.

In the fifth place, very little has been done on the minute pathology of scarlet fever, partly for the reasons already given, that death occurs so seldom during the height of the disease and that it is so difficult to obtain autopsies.

The only *constant* change found is a hyperplasia of lymphatic tissue over the whole body.

The only *characteristic* change reported is the appearance of the bodies described by Mallory in 1903. Mallory announced that he had discovered certain bodies, which he thought resembled protozoa, in four scarlet fever autopsies. He examined the skin of several living cases but did not find them. In his four cases he found the bodies in three situations, lying in vacuoles in the epithelial cells of the epidermis, to a less extent between these cells, and, free in the lymph channels of the corium just beneath the epidermis. They were found usually in small clumps. The bodies are of two types, the granular or reticular, and the radiate. Mallory gave the name *cyclasterion scarlatinale* to these bodies because of the radiate forms which he considered the more characteristic. Mallory's work has been little corroborated up to the present time.

Field in our laboratory examined the skin from twenty living scarlet fever patients and from ten autopsies, as well as from a number of controls, and he came to the conclusion that most, if not all of the bodies were degenerations of the cytoplasm of the host cells. He also found none in living skin.

Having discovered one or two small improvements in histologic technic while working on rabies, we decided to examine another series of cases, employing the new methods in preparing our speci-

mens. This series of cases we have just completed. We examined sections of skins from seventeen living cases, from thirty-three autopsies and from nine controls.

In twelve of the living cases we found scattered groups of small reticular bodies in the lymph spaces, and in seven of these an occasional similar small body within an epithelial cell.

In twenty-seven of the autopsy cases bodies were found, in the lymph spaces in twenty; in the epithelial cells in fifteen. In the majority of these quite a good many bodies were found, but they were practically all of the granular or reticular type. No definite radiate or starshaped bodies were seen. And as to the specificity of the other bodies we found in one of our own controls many bodies apparently identical with those found in the scarlet fever skins.

This control skin was obtained from an autopsy case from the New York Infirmary after death from extensive burn. The section of skin in which the bodies were most frequent was taken from the margin of the burn. As far as we know the child was not suffering from scarlet fever at the time of its death. In this case there were many transition stages from undoubted cytoplasmic degeneration to the definite reticular bodies, a strong point in favor of the cytoplasmic nature of all the bodies. The bodies of this character in the lymph space might come from the cytoplasm of plasma or wandering cells.

So far then in our study of these bodies, we have found no evidence of their being organisms; neither have we been able to demonstrate anything like a tiny organism within the larger bodies, therefore, we cannot agree with Prowazek in including scarlet fever in the group of diseases produced by what he calls chlamydozoa. Prowazek's studies were made principally on vaccinia and trachoma, to the latter of which Dr. Bloom called your attention in her recent paper. He has made no report of studies in scarlet fever or rabies, and yet he includes both these diseases in his group. It seems to us that he has generalized from too few particulars.

Most of our work so far has been on scarlet fever skins, but we feel now that more promising results may be obtained from a minute histologic examination of the exudates and of the superficial tissues of mouth and nose, and possibly of the lymphatic system in general, we are therefore planning work along these lines for the immediate future.

Very much has been written about the role of the streptococcus

in this disease, and many still hold that the streptococcus pyogenes, or a closely related streptococcus is the real cause.

I have asked Dr. Anthony, who has been doing a good deal of work on the presence of streptococci in scarlet fever to tell us about her results and to show us some of her charts illustrating the irregularity of the hemolizing streptococcus and also to show some typical blood agar plate growths.

There is no doubt, at least, that the streptococcus plays an important role in the secondary lesions and sequelæ of scarlet fever, and for this reason, if for no other, antistreptococcic serum has been recommended in treatment. Moser and his associate in Vienna, have been the chief advocates of this treatment, and they claim that in a long series of cases they have gotten striking results. Dr. Park who visited their clinics in Vienna, last summer and went over their charts was not as favorably impressed as they seem to be. In some cases however, the results obtained from the serum were good. In the comparatively few cases that we have treated in this way we have not seen any favorable results. The best we can say, is that it seemed to do no harm.

Recently, under the direction of Dr. Wilson, Superintendent of the Contagious Disease Hospitals, streptococcus vaccines have been tried on a certain number of gland and joint cases, with the idea of influencing favorably the course of these secondary lesions. The injections have been given in thirty-five gland cases, in two of which there was marked immediate improvement with rapid recovery, and in some of the others, there was apparently some improvement. In fifteen joint cases, all seem to show improvement. In one case of peritonitis with joints which had an absolutely bad prognosis, after one injection there was immediate change for the better and the patient quickly became convalescent. So far, though the cases have been too few to draw positive conclusions, the results have been encouraging.

N. Y. CITY DEPARTMENT OF HEALTH,
FOOT OF EAST SIXTEENTH STREET

SYMPTOMOLOGY AND DIAGNOSIS OF LOBAR PNEUMONIA AND BRONCHOPNEUMONIA IN CHILDREN.*

BY

LE GRAND KERR, M. D.,
Brooklyn, N. Y.

Professor of Diseases of Children in the Brooklyn Postgraduate Medical School. Visiting
Pediatrist to the Methodist Episcopal, The Williamsburgh, and The
Swedish Hospitals in Brooklyn, N. Y.

DURING adult life the signs of pneumonia conform, as a rule, very closely to well-defined physical laws, and the diagnosis is therefore usually not difficult.

To recognize the existence and the frequent occurrence of pneumonia during infancy and childhood, one must markedly modify his ideas of the disease as it occurs in the adult. The physical signs of pneumonia in infancy and childhood differ materially from the signs in adult life, and even the relative value of individual signs is not the same during the two ages. A disregard for these facts, or an ignorance of them will readily lead one into error.

Take one instance—lobar pneumonia. In the adult there are the three cardinal symptoms of chill, pain and rusty sputum. In infancy these are usually all absent.

The differentiation between lobar and bronchopneumonia is of somewhat recent origin, for the older writers considered the two types together under the name of inflammation of the lung. The greater facility and skill in auscultation and the application of the principles of histology have made the differentiation possible.

Bronchopneumonia is much more frequent during the periods of infancy and old age, and as its occurrence is somewhat less frequent during the other periods of childhood, many have come to look upon it as a rarity at any other time than infancy.

Those who make accurate notes of their cases know that this is not so, but there are many who are, unfortunately, unwilling or unable to make accurate observations. While the occurrence of bronchopneumonia after the period of infancy (three years) is infrequent, the reverse does not hold true that lobar pneumonia is a disease common only *after* the period of infancy. An ability to diagnose the disease accurately and early will reveal the fact that lobar pneumonia is fairly common even during infancy.

Bacteriology is of little help; children will not expectorate, and if mucus is swabbed out of the pharynx during the act of

* Read before The Williamsburgh Medical Society, May 11, 1908.

coughing, even then the pneumococcus may be demonstrated in either type.

LOBAR PNEUMONIA.

This disease, which is an inflammation of the lungs, due in the majority of instances to the pneumococcus, affects the child at any age, and may even be congenital, the infection occurring through the placenta of the mother. The disease always has an acute course with a sudden onset with high temperature and, when typical, with a crisis on the sixth to the eighth day. The occurrence of a crisis, however, is not essential to a diagnosis of the disease. It is very suggestive at least, and a termination of the disease by lysis would make one suspicious of pleuritis as an accompaniment.

Not infrequently there occurs a seeming crisis, which is almost immediately followed by a rise of temperature, which may persist for a few hours or a few days. There may even be several of these excursions of the temperature, and so we have what might well be called a pseudocrisis. Hepatization may effect the whole of a lobe of the lung or almost all of it.

There are cases which run a very much shorter course in which every symptom is modified or is very mild, so that the whole duration of the disease may not exceed three or four days at most.

One anomalous type, which is not at all uncommon, is that in which all the symptoms are marked and typical for the first seventy-two hours or so, and then there occurs a sudden and complete clearing up of all signs of the disease, the infection not going beyond the stage of congestion. The onset is uniformly sudden, and in children over six or seven years of age, it is most commonly accompanied with chills, as in adults. In younger children there may be some condition present which approximates that of the chill, so that we observe frequently a convulsion or coldness of the extremities and cyanosis, which is most marked about the lips.

Irrespective of the age, one characteristic of the disease is its rapid onset with high temperature (103° to 107° F.), and this onset is not preceded by bronchitis or other diseases essentially, but is independent of all such conditions. In young children a high continued fever with little or no remission occurs so infrequently during the course of any other disease than lobar pneumonia, that its occurrence alone should make one suspicious of the disease, and if there is a real dyspnea present or a marked dispro-

portion between the pulse and temperature, the diagnosis can be almost certainly made without waiting for marked physical signs.

Vomiting is a very common occurrence at the onset, and when the weather is warm diarrhea is usually added. If the child be old enough to complain intelligently, headache and muscular pains are fairly constant features at the onset, and upon the second or third day of the disease pain in the side, which is increased by the act of coughing or of deep inspiration, is complained of. If the child is under the age of five, then the pain in the side is usually not evident, but instead it is referred to the loin, to the epigastrium or to any situation to which the intercostal nerves are distributed. Such pain is generally moderate and of short duration, but may at times be so intense as to suggest conditions outside of the chest as the cause. There is one feature about such pain—that it is never exactly located.

In infancy, if one observed evidences of abdominal pain with vomiting and high temperature, the possibility of lobar pneumonia should at least be thought of, for at this age gastric disturbances are usually not accompanied *early* by abdominal pain. It is a safe rule for the diagnosis of the disease, in any event, to suspect its occurrence whenever there is a rapid rise of temperature associated with markedly increased respirations. And if a short dry cough is present, and also vomiting, coated tongue, etc., the diagnosis is strengthened.

While increased respirations occur as a natural consequence of a rise in the temperature, dependence may be placed upon its value only as there is a marked increase. It is out of all proportion to the increase in the pulse-rate, which in this disease may be one or two. The respirations are usually jerky (if pain is caused by breathing) and are accompanied by a short moan or a short sighing effect, which is characteristic only if associated with the other symptoms (as it may be observed in dyspnea from other causes).

Prostration is generally an early and very noticeable feature as is evidenced by the child giving up easily and becoming exhausted. The pulse is in the beginning full and frequent, but soon becomes weak, small and compressible and sometimes very irregular. Even upon the very first day of the disease the symptoms are sometimes such that the diagnosis can be made without waiting for definite physical signs.

In considering the value of Weill's sign (that there is a lack of

expansion in the subclavicular region of the affected side, irrespective of the situation of the lesion), I have found that it is present in a very large proportion of the cases at some time, and is an early sign in a majority of all cases, so that it allows of an early recognition of the conditions present.

It is usually not until the second or third day of the illness that cough is present, and then it continues throughout the course of the disease. It is short, dry and restricted until the time just before the crisis, and in children who are old enough to expectorate, there is usually then an abundant expectoration of brownish-red or yellowish secretion.

After the first rise, which is characteristically abrupt, the temperature becomes more or less remissive, with daily fluctuations of one to two degrees, until the time of the crisis, when there is an abrupt fall. The urine is naturally scanty and high-colored, and may have traces of albumin through it. Cerebral symptoms may predominate for a time, so that we may observe those which are suggestive of the typhoid state or those which are more suggestive of meningitis.

The Physical Examination.—One must not expect to find signs exactly similar to those in adults. If the peculiarities of the child's chest are not taken into account, the examination will prove misleading instead of conclusive. The earliest percussion signs which we would look for are those which are due to the acute congestion. In consequence of this condition, less air gets into the affected area and more is forced into the healthy portion of the lungs, so that there is usually over the affected area a diminished resonance with an exaggerated resonance elsewhere. This sign, however, is not in any way conclusive. Percussion may even fail to outline the affected area, either because the area is limited in its extent, is covered with healthy lung, is deep-seated, or because a gas-distended stomach or intestine interferes with the examination.

Usually the first auscultatory signs are a feeble respiratory murmur over the affected part, with rather high pitch, while healthy portions may show exaggerated sounds. The latter may be mistaken for bronchial breathing, but it differs in no way from normal breathing, except in its intensity, and is heard upon inspiration only.

Bronchial breathing is still higher in pitch, and is heard with nearly uniform intensity upon expiration as well as inspiration. When consolidation occurs, percussion exhibits marked dullness

over the affected area, with exaggerated resonance elsewhere. Auscultation shows bronchial breathing and bronchial voice over the affected area, and this is clearly and sharply defined. Râles may be observed or there may be pleuritic friction sounds present.

With the advent of resolution all the signs of consolidation gradually lessen, and as far as percussion is concerned, the most persistent signs are slight dullness or diminished resonance. The breathing becomes broncho-vesicular, with the latter element predominating. Moist râles of all varieties are heard. There may be persistence of dry friction sounds, or of respiratory murmur, which is more feeble than normal and slightly higher in pitch (accompanied with slight percussion dullness or diminished resonance).

The diagnosis is usually not difficult, for the sudden onset with the characteristically high temperature, disturbed pulse-respiration rate, possible occurrence of cough, expiratory sigh or moan, and the physical signs are sufficiently marked not to mislead. The sudden onset with vomiting might lead to the suspicion of scarlet fever or tonsillitis as the cause. Scarlet fever would be distinguished by the appearance of the characteristic eruption on the day succeeding the abrupt onset, or, in those cases in which there is little or no eruption, the history of exposure and the presence of sore throat would suggest its possibility, and later, when the physical signs of pneumonia *should* appear, the evidence would be conclusive.

An acute tonsillitis is much harder to differentiate unless there is a clear history of such attacks occurring previously *and the local signs are marked* for it is upon these latter that we depend for an early diagnosis.

During the first day, in infants, an acute gastroenteritis may be suspected, for vomiting and diarrhea are common at this time; but when pneumonia is the cause, the temperature and the prostration are both out of all proportion to the mildness of the intestinal condition.

If during the first days of the disease a dull percussion sound is detected over the inferior lobe of the lung, there may be a question as to its being due to pleuritic exudate. Moderate exudate may give dullness, but associated with it there is a weakened vesicular breathing and not bronchial respiration, as in pneumonia. If herpes are present on the lips or nose, then pleurisy may be almost conclusively excluded, as herpes is rare in pleurisy.

Vocal fremitus, which is so valuable in adults in differentiation, is of no service in this instance in the child. Dependence must be placed upon the character of the fever, the course of the disease, and the physical signs.

In lobar pneumonia the fever is characteristically high (higher than in most other diseases), while in pleurisy there is not so sudden an invasion, but the temperature takes considerable time to climb to any very marked height.

In pneumonia there is usually an end by crisis in a few days; in pleurisy there is lysis and usually persistence for three or more weeks. The physical signs in pneumonia correspond to the affected lobe and appear almost at once over the whole surface, while in pleurisy dullness appears in the lower portion of the lung behind and then slowly increases upward before it is detected anteriorly, the upper border anteriorly always being lower than that posteriorly.

If, even under such examination, the cause of the symptoms remains in doubt, an exploratory puncture may be made.

It is a safe rule, and in fact a very necessary one, to suspect the lungs whenever there is a rapid rise of temperature with much increased rate of respiration. This would lead to examination and re-examination of the chest until the diagnosis of the disease present was sufficiently clear. And a hasty examination of the more prominent parts of the child's chest is not sufficient unless the disease is very typical, for pneumonia in children with obscure symptoms has a remarkable tendency to locate in the more obscure portions of the chest (as high in the axilla or just beneath the clavicles).

Occasionally, at the onset of a lobar pneumonia, the physical signs are not in sufficient evidence to allow of a diagnosis, and the constitutional symptoms which may be present (vomiting, possibly convulsions, delirium, stupor, and even opisthotonos) suggest meningitis. In some of these cases it seems as though the symptoms were designedly deceiving. The symptoms are so suggestive of meningitis from the very start that some authors class this form as a cerebral pneumonia. The cerebral symptoms are apt to differ to a considerable extent according to the period of life—infancy or later childhood. In infancy there is a sudden onset, usually with vomiting and quickly followed by convulsions and semi-consciousness. If the convulsions are not repeated, the semi-consciousness is of short duration and the disease then in no way differs from its usual course; but if repeated convulsions occur,

then the child is for days in a stupor. Other cerebral symptoms then appear under the influence of passive hyperemia of the brain, so that one may observe rigid neck muscles, dilated pupils, possibly strabismus or temporary facial paresis.

In the form as it attacks older children convulsions are usually absent and the somnolent and indifferent condition of the child is more suggestive of the typhoid state than of meningitis. The tongue may be dry and coated. Delirium is usually present at night and the urine and feces may be voided involuntarily. Added to this, there is occasionally rigidity of the neck muscles, a general hyperesthesia and constipation, possibly with sunken abdomen.

In all such cases the character of the fever is important; that is, in lobar pneumonia there is a constantly high temperature, so that in the presence of a morning and an evening temperature of 104° , which has developed suddenly, meningitis would practically be excluded. Such a sudden development with convulsions is peculiar to but one form of meningitis, the purulent, and there is usually abundant evidence as to the cause of its development.

In pneumonia, if the convulsions subside even for a few hours, the mind of the child clears quite rapidly, which is not true of meningitis. In pneumonia, also, the pulse is not slow and intermittent at first, nor is the respiration somewhat slow and irregular, as so often occurs in meningitis. Meningitis exhibits a more profound stupor and a steady increase in the nervous symptoms for three or four days, while in pneumonia they may be very marked during the first twenty-four hours, but generally quickly subside as the pneumonia develops.

A safe guide to the correct diagnosis is this: without paying too much regard to the variety and severity of the symptoms, if nervous symptoms are present from the onset and are marked, meningitis may reasonably be excluded. If they are present at the onset in a mild form, but show a steady increase in severity, or if not present at the onset but appearing later and steadily increasing, then meningitis is to be suspected and not lobar pneumonia. This reasoning holds true even in the presence of pneumonia, during the course of which meningitis is not an unusual complication.

In the form attacking older children, in which the symptoms at first are those of the typhoid state, the history of an initial chill would almost positively exclude typhoid fever, and the early occurrence of the somnolence and typhoid symptoms so

quickly after the first signs of illness would at least be very suspicious of pneumonia and decidedly against a diagnosis of typhoid. At most, one could not possibly remain long in doubt, for the tardy physical signs would eventually show themselves. The diagnosis from bronchopneumonia is considered under that disease.

BRONCHOPNEUMONIA.

This disease is essentially one of infancy and early childhood. In a great many of its aspects it is impossible to decide whether this affection should be classed as a distinct disease or not. It seems to be a combination of two or more diseases at times. Clinically, there is a decided element of mixed infection, with a complexity of symptoms which constantly change as one elementary lesion or another finds prominence. In its multiplicity of forms there is one common lesion, however—capillary bronchitis.

If all its varied phases were to be considered separately, there would be created an indefinite number of forms of the disease, which would be confusing. Capillary bronchitis, while it may give no evidence of a pneumonic process during life, should be classed as a form of bronchopneumonia, because while recognition of such a process (pneumonic) is not detected during life, it is at autopsy. One of the chief differences between this disease and lobar pneumonia is that the former is invariably preceded or accompanied by symptoms of catarrh of the small bronchi.

There are many predisposing causes of the disease, the chief ones being the age of the child (infancy) and the state of the nutrition (malnutrition). Naturally, any disordered condition of the nutrition of a chronic nature is a factor in the etiology, as marasmus, rachitis, syphilis, etc. Other predisposing causes are poor hygienic surroundings, changeable climate, the cold season, the aspiration of foreign substances, the infectious diseases, and so forth. With one or more of these present, it means that the exciting factor (infectious organisms commonly present in the nose, mouth or throat) need only be slight to start the process. Of all the single conditions or diseases which predispose to the disease, bronchitis leads. As has been stated, the one common lesion is capillary bronchitis, and the inflammation involves the whole thickness of the tubular walls and invades the surrounding tissue. By spreading to the alveoli, there are formed small in-

flammatory foci, and as the disease advances several of the formed areas of hepatization may coalesce, forming larger foci. Now, clinically, such a process gives evidence of itself at first by symptoms which indicate a capillary bronchitis with fever.

The mode of onset is as varied as most of the features of the disease, and may be gradual or very sudden; the temperature may be high or remain only slightly elevated throughout the whole course of the disease; the cough may also be very hard or very slight, and so one might go on and enumerate nearly every symptom. The only certain thing about the disease is its remarkable uncertainty.

The commonest form of development is that which comes during an attack of bronchitis, when it is noticed that all the symptoms or most of them are intensified. This intensification is particularly observed in the temperature, which may exhibit an elevation to 103° or 106° F. While the temperature is high, it is subject to considerable fluctuation, and sometimes shows a daily variation of from four to five degrees Fahrenheit. In rare instances it may assume a nearly continuous type.

Low temperatures are very apt to be the rule in delicate children, and this is particularly true of infants suffering from marasmus. Dyspnea is very real and is an early and constant symptom, being easily induced by the acts of crying, nursing, coughing or, in fact, any excitement. Associated with the early occurrence of dyspnea, there is the presence of more or less abundant small râles, particularly in the lower portion behind.

Cough is a much more constant feature than it is in lobar pneumonia, and at first it is dry and hacking, but may have a whistling character, terminating with a short, sharp cry, indicating pain. The persistence of the cough materially disturbs the little one's rest, adds to the general discomfort and may excite vomiting. No expectoration is present in the very young. The respirations are always much increased and, as a rule, are between fifty and one hundred to the minute, and associated with dilation of the nostrils and sinking in of the soft portions of the chest, as is observed in severe dyspneas.

The Physical Examination.—It is somewhat characteristic of the disease that it exhibits appearances of hepatization first in the back, but on both sides of the spine, and consonant râles may be heard there (if the disease is diffuse) for a considerable period without any sign of distinct dullness. In fact, for several days percussion may reveal nothing but hyperresonance. The

amount of percussion dullness is exceedingly meager in proportion to the extent of the consolidation, and if much dependence is placed upon it as an indicator it will prove misleading. Frequently it is not obtained until the third or fourth day of the disease. It cannot be too frequently reiterated or too forcibly impressed that bronchopneumonia may exist in a child and run its full course without the signs of consolidation having been present at any time during the disease. This is true even of some of the cases in which the disease runs a protracted course. The result is that auscultation is of much greater value in the recognition of the condition. There is feeble breathing at first over the affected area on account of the congestion. With this are found coarse, sonorous and also fine sibilant râles, which are soon replaced by the very fine moist râles. These are somewhat definitely located in the lower lobes posteriorly. The respiratory murmur is enfeebled and assumes a higher pitch. Everywhere else in the chest (except lower portion behind) there may be found coarse râles which have persisted and are due to bronchitis of the larger tubes. In many instances these are all the signs which are obtainable throughout the disease.

The next change is generally that the fine moist râles are heard over a much enlarged area and are more strictly localized at some one point, and this is usually over one lower lobe posteriorly and close to the vertebral column. At this place the râles are found to be louder, higher in pitch and apparently more superficial. Over such an area there is bronchovesicular and enfeebled respiration, and as the consolidation becomes more evident bronchial breathing becomes more and more pronounced.

The areas of consolidation are not, as a rule, sharply defined, and are at first small, with an extension until nearly all of one or both lungs posteriorly give signs of involvement. Bronchial breathing is pure over the center of the consolidated area, but there are râles at the edges. Friction sounds are rare. In the later stages of the disease the evidences of the bronchitis persist often over the entire chest, but most markedly or entirely behind, the coarse and finer râles intermingling.

Convalescence is indicated by the gradual disappearance of the signs of consolidation and the persistence of râles of all kinds and friction sounds perhaps for two or more weeks.

Even with its variable symptoms the diagnosis of bronchopneumonia is presumably made if, in an infant, we observe a high temperature with marked daily fluctuations, associated with

much increased respiration, cough and dyspnea, positive signs of other disease being absent.

From bronchitis it is distinguished by the more marked intensity of all symptoms, except the cough (which is usually worse in bronchitis), so that during the course of bronchitis, if there is an intensification of symptoms, we suspect the development of bronchopneumonia. Of much importance in the distinction is the presence of real dyspnea, which is not present in bronchitis. Subcrepitant râles, which are heard at the base of the lung and increased percussion resonance, are indicative of bronchopneumonia. If, instead of being diffuse, as they are in bronchitis, the râles show a tendency to limitation at certain points, the diagnosis of bronchopneumonia is probable.

The distinction from lobar pneumonia is usually easy, for in that disease the inflammation at once occupies the lung tissue without a preceding bronchitis, and from the very start a whole or almost a whole of one lobe is affected. It occurs in later childhood usually and in previously healthy children. The onset is with well-defined symptoms, suddenly developed and running a typical course. Bronchopneumonia is mostly bilateral, and the favorite situation is the lower portions of the lung behind while lobar pneumonia is unilateral and shows no preference for the lower part of the chest, affecting the upper portions quite frequently.

In lobar pneumonia the temperature at once is high, and with slight oscillations maintains the same level for several days, ending often with a crisis; but in bronchopneumonia the temperature is not so suddenly developed, nor does it rise to such a height, and when high remains so only for a few hours, exhibiting considerable variations daily, which may amount to four or five degrees Fahrenheit. The termination is by lysis, which lasts from three to seven days.

When the course of a bronchopneumonia is protracted for several weeks, the question at once arises whether there is a tuberculous process present or not. This is especially the case if there have been the formation of bronchiectasiæ and upon examination, large, consonant râles are observed with cavernous respiration. To correctly differentiate these two diseases, advantage must be taken of every possible facility to determine the family history and every other factor which might prove of value.

Physical signs are not sufficient for the diagnosis, for in both

conditions they may be similar; and in many instances the etiology seems to be the same. The onset of tuberculosis is usually gradual; it may have been apparently sudden, but a careful consideration of the history will generally show beyond all doubt that for weeks before there have been symptoms present which would indicate a tuberculous infection, but these have been overlooked at the time.

When the development is sudden (apparently), there is nothing in the physical examination or in the constitutional symptoms which will aid in the differentiation, except that at times there is a loss of flesh which is disproportionate to the severity of the symptoms. No positive diagnosis is possible until the time of expected resolution in bronchopneumonia, and then instead of its occurrence we are sometimes confronted with a persistence of symptoms which at once suggests the possibility of tuberculosis. No reliance can be placed upon the character of the temperature. Examination of the sputum is of little value, for in children under six or seven, it is almost impossible to obtain the proper material for an examination. Wasting which is out of proportion to the severity of the symptoms and the presence of a marked anemia are indicative of tuberculosis.

Tuberculosis is usually developed anteriorly at first, and bronchopneumonia posteriorly. If the condition has developed insidiously, during the convalescence from one of the acute infectious diseases, it may be bronchopneumonia, but the strong probability is that it is tubercular. Occurring during the course of pertussis, it occasionally happens that a bronchopneumonia will persist until the pertussis has completely run its course. Generally speaking, it makes but little difference how irregular the course, or how persistent the disease present, if a thorough examination shows beyond all doubt that the child was previously healthy, that there is no family tuberculous history or probability of infection, that the surroundings of the child were good and that the disease developed under the influence of one or more of the usual etiologic factors of bronchopneumonia, then tuberculosis may be excluded as the cause. It is very evident that there cannot be complete certainty as to the exclusion of tuberculosis in these protracted cases, because, in the presence of some tuberculous predisposition it may complicate the original disease.

There is always danger of diagnosing bronchopneumonia when the true condition may be malaria, and this is especially true if

the malaria has been preceded by a bronchitis or if the onset is accompanied with congestion of the lungs, as it sometimes is. It is impossible, under such circumstances, to make a diagnosis without watching the temperature for sometime. In bronchopneumonia there are remissions of the temperature which may be marked, but there is never an intermittence, as in malaria. Enlargement of the spleen would favor the diagnosis of malaria if the enlargement was marked, but not otherwise.

The effect of proper treatment would aid in the distinction of the two diseases, but the demonstration of the plasmodium malarix in the blood would settle all doubt as to the presence of malarial infection.

Congenital atelectasis would at times offer considerable difficulty in its distinction from bronchopneumonia during the first three months of life (after that it rarely, if ever, gives symptoms). But atelectasis may be eliminated as the cause if the child has been well and vigorous from the time of birth and if, at the time of birth, there was no difficulty experienced in getting the infant to breathe. In atelectasis the physical signs are absent or doubtful and cyanosis is not proportionate to the lung involvement, but is excessive.

42 GATES AVENUE.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON PEDIATRICS.

Meeting of May 14, 1908.

GODFREY R. PISEK, M. D., *in the Chair.*

AMAUROTIC FAMILY IDIOCY.

DR. GOLDSTEIN made a report on two such cases:

CASE I.—The child was a female, twenty months of age. There was no history of any blood relation in the family. There was no history of tuberculosis or functional or organic disease or of syphilis. This was the second child, the first child dying when eighteen months of age from some unknown condition. This child was breast fed. She had no infectious diseases. When five months old she played with her toys and took notice of things about. Then she did not play with her toys. Her bowels were constipated and enemas were given. The child nodded its head with a slow motion. The anterior fontanel was closed. The ophthalmoscope revealed the characteristic

milky-blue or white optic disc, with bright cherry-red center, occupying the place of the macula lutea. She sighed deeply. The lungs, heart and abdomen were negative. The extremities were spastic, but with gentle pressure this could be overcome. The reflexes were exaggerated.

CASE II.—This child was a male, twelve months old. He was a first child and the history given was practically the same as in Case I. There was no history of any infectious disease. He was practically well up to the age of four months. He played, cooed and lived as a normal child. The symptoms and findings were practically the same as in Case I.

DR. GODFREY R. PISEK saw the case in his clinic and gave a very unfavorable prognosis. These cases were apt to go from one man to another. In this case a diagnosis was made by an examination of the fundus of the eye. Mothers think that the children do see, and unless great care was taken the condition might be overlooked.

DR. GOLDSTEIN regretted that the other case he expected to present had not arrived. This was a very stout child and there was no atrophy of the optic disc.

HYSTERIA GRAVIS IN A GIRL OF NINE YEARS.

DR. SARA WELT-KAKELS presented Jennie S., nine years old, born in Russia, and who came to this country about eleven months ago. She came under observation at the Mt. Sinai Dispensary about the beginning of April of this year. The family history revealed nothing of importance. The parents were Russian Jews, both healthy. Two other children were well. One child died of dysentery. Another child was born prematurely at the seventh month and lived two days only. The previous history revealed the fact that she was born at full term; that she was at first asphyxiated for a short time. She was breast fed. She had had measles when eighteen months old and had also an attack of dysentery that lasted three weeks some two years ago. Otherwise she had always been healthy. Her present illness dated back to October, 1907, when she complained of weakness of the legs, dyspnea and palpitation. She had spells in which the eyes rolled up; she would shake violently and scream. She did not lose consciousness and never injured herself. There was no stupor or drowsiness afterward. The attacks occurred at first three or four times a week; lately they had become more frequent. In the last few months she would not go to school. She complained of frequent headaches, lost her appetite and was rather constipated. She had been under the care of various physicians, but her condition continued to grow worse.

She was a pale but fairly well-nourished child. She weighed fifty-three pounds. The skin and visible mucous membranes were pale. The submaxillary, anterior and posterior cervical and superficial lymphatic glands were somewhat enlarged. She

made occasional grimaces slightly involving the frontalis and some muscles of the nose. The pupils were normal. The fundus was normal. There was no change in sensation. There were no tender areas. The abdominal and epigastric reflexes were lively. Babinsky's symptom was absent. The thorax was rather long and narrow and the movements of the thoracic walls during inspiration were subnormal. Nothing abnormal was revealed in the physical examination of the chest contents and abdomen. The changes in the abdominal contour were curious; during inspiration the abdominal walls were pushed out like a balloon; one would be inclined to suspect the presence of fluid in the abdominal cavity or a growth, but palpation and percussion showed nothing abnormal. The condition thought of was a paralysis of the abdominal muscles, but the electric reaction proved them to be normal, and examination with the fluoroscope showed normal excursions of the diaphragm. The phenomenon had quite changed since the child came under observation; quite often there was associated with a protrusion of the wall of the abdomen a lateral rotation to the left. The examination of the urine and blood showed both to be normal. In regard to the absence of so-called stigmata. Dr. Welt-Kakels called attention to an article published by Thomas, of Boston, on "Hysteria in Children" in which was specifically mentioned the fact that in nineteen out of twenty-nine cases there were no disturbances of sensation. The lesser stigmata were frequently absent in these cases. The symptomatic character of the hysteria, especially in young children, the absence of stigmata, make the diagnosis of hysteria in children difficult, and it might become necessary to observe the course of the symptoms. A temporary complete disappearance of the symptoms, or the variability of the symptoms would be of aid in making a diagnosis. The prognosis of hysteria in children was better than it was in the adult as the cure was always the result of psychological treatment. Children were more credulous than adults, were easier to be intimidated and more used to obedience. Two methods of treatment were recalled. One of intentional neglect; by this was suggested the unimportance of the symptoms, and it was capable of a great many variations from disregard of complaint to complete isolation of the patient. The second method was one of surprise, the object being to remove the loss of control. It showed the child that a thing it had been unable to do before could be done now. Some objection had been made to this latter method, as it might result in fright to the child and might be harmful. Electricity and hydrotherapy have been used, both probably acting by suggestion.

CASE OF INFANTILISM.

DR. CHARLES HERRMAN presented this case to help in the illustration of the paper to be read by Dr. Schwarz. He had had the opportunity of observing this case for nearly one year.

The patient was ten years old. The parents were both healthy. They had eight children, six living and all, with this one exception, were normal. The child was breast fed for fourteen months. She had all her teeth. She began to walk when three years old and could speak a few words. She had measles when two years old. When six years old, she weighed twenty-five and one-half pounds. The most striking thing about this child was that it was so well proportioned. There was no disproportion between the head, the extremities and the trunk. The child was merely a miniature one. At that time there had been no symptoms characteristic of cretinism, a condition he at once thought of. There was nothing characteristic in the skin, no enlargement of the tongue, no subnormal temperature or umbilical hernia; there was constipation but it was not marked. On the strength of its size and retardation and the condition of the head, the child was placed on thyroid treatment. The child then began to grow. It measured 81 cm. in August and, at the end of two months, this measurement had increased 2 cm. the two following months it increased two more cm. In December it measured 85 cm., an increase of 4 cm. The treatment was then discontinued for over two years.

In June, 1905, when the child was seven years of age, intelligence was below the normal. The child could add two and two when seven years and two months old. A radiograph of the carpal bones showed only two centers of ossification in the wrist. The patient was again placed under thyroid treatment and then began to increase in size. In December she had gained 4 cm. and in April 2 cm. and she then continued to grow constantly. When eight and a half years old she measured 98 cm. Then she played and read simple sentences. In June, 1907, she measured 99 cm. The child today was in the fourth class and was able to add six and five and four.

DR. HERRMAN had reported another case of infantilism at the Harlem Medical Society. This case was a boy sixteen and one-half years old. At that time he weighed seventy-one pounds and measured four feet and nine inches. The interesting feature in this case was the size and weight for a boy sixteen and one-half years old. He presented none of the signs of puberty, the genitals were undeveloped, and he was markedly anemic since birth. He was always pale and short of breath. He had a systolic murmur which was probably not organic; there was an accentuation of the pulmonic sound, and a tentative diagnosis was made of congenitally small arteries. The teeth were carious. The child had always had good hair.

SOME CEREBRAL CHANGES FOLLOWING SCARLATINA AND MEASLES.

DR. MAX G. SCHLAPP reported three cases, two following measles and one following scarlet fever:

CASE I.—This patient was a boy, eight years old. He lived

in Schenectady amid good surroundings. His appetite and digestion were good and his bowels were regular. He was a first child and labor had been hard. The mother had had two miscarriages and two children since. The miscarriages were attributed to overwork. The child was bottle fed. There were no symptoms or signs of syphilis in mother, father or child. When one year old he had an attack of measles; the attack began with convulsions. The patient had complained of feeling ill and had some headache. He developed the typical symptoms of measles. After the convulsion he went into a state of unconsciousness and delirium, remaining so for five days. After he came out of his unconscious condition the convulsions continued for three weeks; they averaged about fifteen a day. When two years old he had an attack of chickenpox from which he made a good recovery. He had now and then a convulsive attack, but they were so infrequent and slight the mother did not pay much attention to them. He did not complain of headache, vomiting or of any of the symptoms of cranial disturbances. For the last two years the convulsions have been more frequent and more severe. During the past two weeks they have been coming on twice a day. They are typically epileptic, begin in the hand, and spread to the face and leg. The weakness in the hand has increased so that it is now partly paralyzed. The hand is held in a peculiar position. The leg is also weak and the muscles of the face. When he first came to the hospital the convulsions were very severe and these were evidences of the motor areas being involved, particularly of the arm, leg and face. He thought an operation would relieve the condition and suggested it. Dr. McCosh operated, exposing the anterior and central convolution. The cortex was found to be discolored. The motor areas were hard and firm.

CASE II.—This was a boy, sixteen years old, living in the city, who came to the hospital because of Jacksonian convulsions and weak mental condition. There was nothing in the family history of importance. Neither parent was a drinker, and there was no history of syphilis, tuberculosis, nervous or mental trouble. The child was born with great difficulty. He had slight rickets. When one and a half years old he had an indefinite illness of three weeks which was diagnosed as measles. He had attacks of unconsciousness with twitchings of the left side. The left hand was paralyzed and useless. At the age of two years he appeared to have recovered completely and to be a normal child. At the age of two and a half he began to be fretful. The attacks then began with a sense of depression, twitchings of the left hand; then the child would fall asleep, and sometimes he would vomit. These attacks occurred about once in from two or six weeks and they gradually increased in duration up to the eighth year. His mental condition became worse. Jacksonian epileptic attacks occurred involving the left hand, leg and face. Because of the severe involvement of the hand, the spastic

condition and the history of complete paralysis he thought it advisable to operate. Dr. McCosh operated and they found hardening in the arm center.

CASE III.—A boy, eight years old, was brought to the hospital in an unconscious condition. This boy had had scarlet fever when three years old. During the acute attack he had convulsions, and was in an unconscious and delirious condition for five days. These convulsions continued severely for two weeks, and then subsided so that the child only had about one convulsion in four or six months. The family history was good. There were three sisters and two brothers. The child was brought to the hospital March 10 and died on March 16, without regaining consciousness. At the autopsy an unusual condition was found. Evidently in his convulsive attacks he had fallen, struck his head and had a hematoma pressing upon the brain.

The chief interest in these three cases centers in the pathological findings. In the first case there was a gliosis, an increase in the number of fibers and an accompanying destruction of the nerve-cells. In the second case there was unquestionably a cyst, but with this cyst there was some gliosis. This patient recovered slightly. An interesting condition was found in the third case. One hemisphere was smaller than the other. At the base of the temporal lobe was found a little nodule. In the second case there was undoubtedly a destructive lesion, a liquefaction necrosis, with absorption of the dead tissue and the formation of a cyst. These cyst walls were surrounded with a lining of true connective tissue. In the first case there was something in the way of a lighter lesion, not causing a necrosis of tissue, but something which acted as an irritant. In the third case, it was an inflammatory process. To be sure there could have been a toxic process involving the brain, but he believed these cases were due to an encephalitis, the result of scarlet fever and measles. The inflammatory process acted as an irritant and gave rise to the phenomena which followed. There was no question about there having been a gliosis. Such a condition could not exist in a normal brain. Therefore, it must have resulted from the inflammatory process following the measles or scarlet fever. The same condition resulted from a trauma of the brain; clinically, such cases were known as post-traumatic dementia.

DR. SARA WELT-KAKELS said that three years ago she had the opportunity of reporting three cases of deranged mental conditions following acute infectious diseases.

The first case was a boy, five years old. In the defervescing stage of scarlet fever he became delirious. He had delusions of sight which were repeated on the day following. An interesting feature in this case was that there had actually been a fire in the house, and fire was the subject of his delusion.

The second case was a boy, ten years old, who had a diphtheritic sore throat and was also in the stage of defervescence. In this case the patient became restless and finally he became

maniacal. This condition continued for three months, when he recovered.

The third case was a girl, ten years old, who had gone through a slight attack of diphtheria. During her convalescence she became depressed and melancholic and cried a great deal. She finally developed an impulse to kill her mother. These symptoms after a few weeks entirely disappeared, and she made a good recovery.

With regard to the etiology in these cases, Dr. Welt-Kakels believed that the infectious agent acted upon the ganglion cells; the slight irritating influence was sufficient to produce the mental disturbances. Systemic psychoses did not always terminate so favorably: sometimes they ran on to idiocy. They also might in later life become inmates of insane asylums.

DR. F. L. WACHENHEIM said that we could not be too careful in making a distinction between the cases that had just been reported and cases of encephalitis. These psychoses were asthenic, the result of some disturbance caused by an infectious agent. They could be distinguished by the character of the onset. The characteristic thing in encephalitis is that the convulsions or paretic attack might pass on to complete paralysis. The mental symptoms only appeared gradually. These were two different conditions and we should be on our guard. The prognosis in encephalitis was bad.

DR. SHEFFIELD could not understand how one could call these convulsive attacks a complication or sequella of measles or scarlet fever. He had seen such symptoms follow influenza. He asked Dr. Schlapp why such symptoms should, in his opinion, result from attacks of measles and scarlet fever and why they did not follow other conditions.

DR. MAX G. SCHLAPP said there was no question but that these attacks of encephalitis resulted from croupous pneumonia and other infectious diseases, and they should by no means be restricted to measles and scarlet fever. Conditions with gliosis were more commonly met with after measles and scarlet fever, than after other infectious diseases. That might be because they were more common in children.

A CASE OF INFANTILISM.

DR. HERMAN SCHWARZ presented a boy, sixteen years of age, born in New York of Irish parents. There were no signs of lues or tuberculosis in the family. The child was a blue baby. He had no skin eruptions. He had snuffles. The first tooth appeared when he was one year old. He walked when he was two years old. It was noticed that he was small when he was twelve years old. He came in the clinic two years ago because he would not grow. His general condition was fair, he was fairly well-nourished. The hair grew very slowly, and he needed a hair-cut once in four or five months. The hair was rather

brittle. The eyebrows were poorly marked and sparse. Eyelashes were normal. The skin was thin, delicate and smooth. The nose was broad, alæ well formed. The mouth was small and well-shaped. The forehead was wrinkled. The face was small. The color of the eyes was gray, the pupils were small, round and reacted to light quickly. The background had not been examined. The teeth were in good condition and well-formed. The ears were well shaped. The throat was negative, the palate not high arched. The thyroid was not palpable. The larynx was not large. The thymus not percussibly large. The apex of the heart was not palpable. Sounds were negative. Lungs were negative. The spleen was just palpable. The border of the liver was felt two fingers below the free border of the ribs and was just palpable. The bones showed no enlargement and no deformities. The measurements gave the following: Length, 115 cm. (normal for fifteen-year-old boy, 159 cm.). Weight, forty-five pounds (normal for fifteen-year-old boy, 110 pounds). Cranium to umbilicus 45 cm.; umbilicus to sole of foot, 69 cm. Tuberosity to cranium in sitting position, 57.3 cm. One-half length of body, 57.5 cm. The head measurements were as follows: Crown 50.5 (usual, 55 cm.); occipito-frontal diameter 15.5 cm.; occipito-mental diameter, 17 cm.; biparietal diameter, 13.5 cm. The circumference of the chest was 55 cm. (normal, 76 cm.). The antero-posterior diameter of the chest was 12.6 cm.; the transverse, 16.4 cm. The abdomen at umbilicus was 53.5 cm. From the acromion process to the tip of middle finger, 50.5 cm.; from the acromion process to the olecranon, 24 cm. From the anterior superior process to the internal malleolus, 62 cm.

INFANTILISM AND ALLIED CONDITIONS.

DR. HERMAN SCHWARZ read this paper. He said that his reason for going into this subject a little more in detail was because of the rather scant attention given it in most of the textbooks. Infantilism was a retarded development, an under-development. The individual remained small, embryonal, infantile or adolescent in body or mind. It was purely an arrest in development. This arrest might be at the time of embryological, infantile or adolescent life. Up to the period of arrest the child was perfectly normal. Infantilism he classified into universalis and partialis. The latter might be subdivided into infantilism partialis formalis, as when an organ was infantile in form but adult in function; viz., ovary infantile but ovulating and infantilism partialis topicus, normal as to form but infantile as to function; viz., no ovulation. Dr. Schwarz then compared the various parts of the body and discussed their infantile characteristics.

A classification from an etiological stand-point of general or universal infantilism was as follows:

- (a) Infantilism with myxedema or cretinism.
- (b) With Mongolism.
- (c) Infantilism due to disturbances in function of the testicles, thyroid, thymus, adrenals or hypophysis cerebri.
- (d) Infantilism dystrophicus, due to
 - (1) Arterial aplasia (angiospastic infantilism).
 - (2) Hereditary syphilis.
 - (3) Primary brain disease.
 - (4) Alcohol or other poisons in the parent, such as lead.
 - (5) With early constitutional disease, such as tuberculosis.
 - (6) Due to poor food and hygienic surroundings.
 - (7) Trauma.

As to the rôle the various glands played in the production of infantilism, opinions differed.

Clinically, infantilism might be divided into two types, the Lorain and the Brissand. In the Lorain type there was the stunted growth. The head was relatively small. There were thin, long and lanky extremities, with a short trunk. They were weak developed. Their sexual development was small. In the male the testicle remained small and the penis rudimentary. Mentally they were at almost the age they represented. In the Brissand type there was the stunted growth, the large head, rounded face, prominent abdomen, short legs, irresponsible character, fat, chunky. The characteristics common to both forms were stunted growth, lack of development of the genital organs, absence of the advent of puberty and the accessory sexual characteristics. The following were the differential characteristics:

In the Lorain type: (1) The individual thin, drawn out. (2) Head relatively small. (3) Face long and thin. (4) Trunk relatively small. (5) Extremities long.

In the Brissand type: (1) Individuals fat and chunky, the appearance of the body was thick, full and rounded. (2) Head relatively large. (3) Face rounded and puffy. (4) Trunk large and thick. (5) Extremities small.

DR. SCHWARTZ then gave some anthropological measurements which were important in placing the patient as an infant or an adolescent.

DR. SHEFFIELD asked about the mental condition of the child presented by Dr. Schwarz.

DR. SCHWARZ replied that it was that of a boy of that same age. He was in the fifth grade at school. There was absolutely no sexual instinct.

DR. L. E. LAFETRA said that this was to him an interesting type of case. Cretinism had long interested him both from a therapeutic as well as a diagnostic stand-point. He had tried the methods of treatment that he had found in the literature, but without success. He referred to an article of Bramwell's that came out years ago and he thought the treatment recommended was as good as any perhaps yet offered. It certainly had given him good results.

RHEUMATIC AFFECTIONS IN CHILDREN. A CLINICAL STUDY.

DR. F. L. WACHENHEIM read this paper. He said that a clinical review of a fairly large material might serve to illustrate some matters that became clearer as more and more cases were studied. In the course of forty-one months he had been able to collect 113 cases of rheumatic diseases out of a total of about 8000 children. The total number of children between the ages of 0 and 3 years was 5200; of these there were four rheumatic cases (0.08 per cent.). The total number of children between the ages of four and eight years was 1,900; of these there were fifty-five rheumatic cases (2.9 per cent.). The total number of children between the ages of 9 and 13 years was 900; of these there were fifty-four rheumatic children (6.0). The distribution of the various types of rheumatic disease was as follows:

	Chorea.		Endocarditis.		Rheumatism.		Total.	
	m.	f.	m.	f.	m.	f.	m.	f.
Chorea alone	4	5					4	5
Chorea and endocarditis	5	3	5	3			5	3
Chorea, endocarditis and rheumatism	3	4	3	4	3	4	3	4
Chorea and rheumatism	0	5			0	5	0	5
Endocarditis and rheumatism.			21	27	21	27	21	27
Rheumatism alone?					16	20	16	20
Total.	12	17	29	34	40	56	49	64

This table showed that these phases of rheumatic disease were somewhat commoner in females; also that uncomplicated rheumatism was not the rule. Of the ninety-six cases of rheumatism very few were severe and, as a rule, treatment with the salicylates was rapidly effective. In the subacute cases, when only one of the lower extremities was affected, their chief diagnostic difficulty was the exclusion of articular tuberculosis. The therapeutic test would clear up many of these cases, but not all. He warned against making the diagnosis of rheumatism in infancy and early childhood. Still, he could report two cases of torticollis, aged respectively fourteen and sixteen months, who got well in a few days on small doses of salicylates. Two of his rheumatic cases presented purpura, and both were complicated with endocarditis. It was worthy to note that of some half a dozen cases of erythema multiforme and two of Henoch's purpura, not a single case suffered from a cardiac lesion. It was evident that purpura was not necessarily a symptom of true rheumatism. The cardiac cases ranged from the very acute to the chronic and fully compensated valvular disease. Usually the mitral value was alone

affected, sometimes also the aortic. The relatively infrequency of pericarditis was shown by the observation that only one case occurred in the entire series. About 60 per cent. of all his cases presented an unquestioned cardiac lesion; a number, in addition, has so-called functional murmurs, without demonstrable hypertrophy or dilatation. Two points seemed to be proved beyond reasonable doubt. First, that the endocardium was the seat of election for the rheumatic infecting agent during early childhood, and that implication of the articular serous membranes became conspicuous only after the fourth or fifth year. Second, that the prognosis of valvular disease, especially of the mitral valve alone, was far better than set down in the books. It was well to be extremely reserved in regard to the prognosis of cardiac cases under the age of puberty. Compensation was easily established in young children, but also easily upset, and the danger of recurrence and exacerbations was ever before them until the age of fourteen was reached, when conditions became more stable. Sudden death was rare in children. He reasserted the interrelation of chorea, endocarditis and rheumatism. Only one-third of his twenty-nine cases of chorea failed to show one or the other or both complications. Tonsillitis was a strikingly frequent complication in his series. While the danger to life was not great, still 1 or 2 per cent. succumb either to heart failure from an endo- or pericarditis or to exhaustion from chorea. The hospital cases gave a worse prognosis than the milder types that visited the dispensary. With regard to recurrences the prognosis was not good; many of the cases return with relapses, and no doubt many more turned up subsequently at other dispensaries. In the majority of the recurrences they found a recrudescence of the cardiac lesion, but some children were more fortunate in suffering again and again from mild attacks of rheumatism and no endocardial involvement. Not until puberty could they notice any tendency of the cardiac condition to become practically stationary; they could not, therefore, ever commit themselves to a favorable prognosis before the fifteenth or even twentieth year; whereas in adults they could often gauge their patient's outlook fairly accurately for ten or even twenty years ahead. To state it concisely, rheumatism in children was a most serious affection, the more so the younger the patient. The prognosis could never be stated as good, often as bad, still oftener as doubtful with the prospect of permanent impairment and shortening the expectation of life. In children, as in adults, the salicylates were the main resource in the treatment of rheumatism, but they were not infallible. The most striking effect of these drugs was the relief of pain, and severe pain was unusual in early life in rheumatism. He found the salicylate of sodium the most efficient. Rest in bed and immobilization were important adjuncts to medication and should never be omitted. Warmth was also useful and

should be applied as continuously as possible. In the subacute and chronic cases, tincture of iodine applied locally was of some little use. His experience with the oil of wintergreen did not warrant any enthusiasm. Endocarditis should be treated essentially with rest in bed and the local applications of cold. Cardiac stimulants should be reserved for contingencies. Much harm had been done by the indiscriminate administration of digitalis, which undoubtedly did not favor the cessation of the inflammatory process, and deprived the heart muscle of that rest which was the prime indication in acute endocarditis. Digitalis should be reserved for deficient compensation in chronic heart disease, when an exacerbation could positively be excluded. Chorea should be treated by absolute rest in bed. The value of arsenic was becoming more and more doubtful, and its employment was quite empirical.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Need of Accuracy in Prescribing Starch in Infant Feeding.—Maynard Ladd (*Arch. Ped.*, April, 1908) thinks it surprising that a practical method of prescribing starch in percentages has not been evolved. As an infant's ability to digest starch is undeveloped at birth and increases with age, he would begin with small percentages and gradually increase, as is done with proteids and fats. It has been found that the decoction made by using two and one-third ounces of either barley or oat flour to a quart of water, cooking for thirty minutes and adding sufficient water to make one quart, yields about 3.50 per cent. of starch and is as thick a solution as can conveniently be strained. This 3.50 per cent. decoction has therefore been adopted as the stock solution in the milk laboratories. On this basis the amount of this stock cereal decoction to be added to any mixture of modified milk to obtain any percentage of starch can be calculated by the formula:

$$\text{No. of ounces of cereal decoction} = \frac{\text{Starch percentage desired} \times \text{total ounces of mixture}}{3.50}$$

By using three ounces of the flour to a quart of water, the stock solution of cereal gives 4.5 per cent. of starch, and if straining the solution is dispensed with, higher percentages can be given than in the above table, the limitations of which can be easily calculated by the general formula given above, 4.50 being substituted for the denominator 3.50. As an ounce of the flour by measure is practically the same as by weight it may be measured by the mother with sufficient accuracy with the graduate used for the milk.

Buttermilk in Infant Feeding.—J. W. England (*Month.*

Cyclop. Pract. Med., April, 1908) says that the routine use of buttermilk is objectionable, because the casein of the milk has been decalcified and changed into casein lactate curd, which is not the chemical form of casein normally produced with human milk, that is, free casein, the formation of which in the stomach of the infant is absolutely essential for the proper development of the chemical functions of the infant stomach. The introduction of an acid-food into the stomach of a healthy infant eliminates the necessity for the production of the acid gastric juice, and more or less gastric atrophy results; and while this latter condition may be apparently removed by the continued use of the buttermilk, an abnormal physiological condition will become established. In the treatment of gastric atrophy (where there is a deficient supply of gastric juice of deficient acidity) the temporary use of buttermilk has yielded excellent results; but when the infant's digestive system has become accustomed to buttermilk-feeding, and a change is made to sweet milk, diarrhea results, showing that an abnormal physiological condition has been created. The acidity of the gastric juice of nurslings is usually 0.1 to 0.2 per cent.; that of buttermilk, from 0.5 to 0.8 per cent.

Lactacid Milk in Infant Feeding.—Charles Carter (*N. Y. Méd. Jour.*, April 4, 1908) says that lactacid milk is obtained from clean, fresh cow's milk, fermented by the lactic bacillus. The degree of acidity is limited by the time allowed for the activity of the bacilli. Buttermilk-feeding and lactacid-milk feeding are absolutely distinct. The former affords an uncertain and temporary expedient always and, being a spontaneously sour milk, contains, besides the lactic ferments, generally yeasts which produce alcohol. In infant feeding, the frequent desideratum of high proteid percentages may be found not only possible, but also safe, with lactacid modification of milk. The digestive enzymes of natural milk are not killed as in the unnatural processes of sterilization or even in pasteurization, but are augmented by the bacillus bulgaricus. Lactic acid inhibits intestinal putrefaction. Lactacid milk is logically indicated in children: (a), in difficult feeding cases; (b), in fermentative diarrheas; (c), in specific enteric infections of typhoid or tuberculous bacilli.

Proportions of Fat and Proteins in Cow's Milk.—On account of the interest in percentage feeding, the study by L. L. Van Slyke (*N. Y. Med. Jour.*, May 30, 1908) based upon 300 analyses of the mixed milk of numerous herds, 650 analyses of milk of fifty separate herds of cows, covering a period of about six months, and several thousand analyses of milk of individual cows, representing seven different breeds of cows, covering for each individual several lactation periods and an aggregate of about 100 periods of lactation, is of interest. In single milkings of individual cows, the fat varied from 2.25 to 9.0 per cent.; the total proteins, from 2.19 to 8.56 per cent.; the casein, from 1.59 to 4.49 per cent.; and the albumin, from 0.31 to 5.32 per cent. The

highest percentages are found in the case of cows far along in lactation. In the case of individual herds of cows, the fat varied from 2.90 to 5.50 per cent.; the total proteins, from 2.31 to 3.71 per cent.; the casein, from 1.79 to 3.02 per cent.; and the albumin, from 0.41 to 0.97 per cent. In the case of milk consisting of a mixture of the milk of many different herds of cows, the fat varied from 3.04 to 4.60 per cent.; total proteins, from 2.53 to 3.76 per cent.; casein, from 1.93 to 3.00 per cent.; and albumin from 0.47 to 0.88 per cent. The following conditions are those of special prominence in causing variations of percentages of fat and proteins in milk: (1) Individuality; (2) breed; (3) stage of lactation; (4) food; (5) season; (6) time and manner of milking, including fractional milkings, milk from different quarters of udder, and relative order of milking a quarter of udder. In Guernsey and Jersey cattle the ratio of fat to proteins is relatively high; in others relatively lower. Individuals of the same breed may vary considerably in this respect. The ratio of fat to proteins is very uniform through the lactation period, until about the ninth month when the total proteins increase quite rapidly in relation to fat. The ratio of fat to casein is very uniform throughout the entire period of lactation, there being a slight increase of casein in relation to fat about the ninth month. Variations in composition of milk due to manner of milking affect the fat more or less extensively, but the proteins very little. Albumin in milk varies quite widely in relation to casein. The ratio varies (1) with different breeds; (2) with different individuals of the same breed; (3) with time and manner of milking. The relation is quite uniform during the first eight or nine months of lactation, after which the albumin increases relatively more than the casein. In the case of herd milk containing 3.00 to 4.50 per cent. of fat, the following formula for calculating the amount of casein has been found to give in most cases quite satisfactory results: $(F - 3) \times 0.4 \times 2.1 = \text{per cent. of casein in milk}$ (F equals number representing the percentage of fat in milk).

Vegetable Diet and the Lacto-farinaceous Regime.—Clemento Ferreira (*Arch. de Méd. des Enf.*, May, 1908) says that there are conditions of the intestine in which it is impossible for the child to assimilate milk or albuminoids and in which after the fermentation has been relieved by the water diet it becomes necessary to substitute some form of nourishment that does not contain proteids. It has been long thought that infants could not digest starches, but the author considers it demonstrated that this is an error. Infants can assimilate vegetable substances properly prepared and these will be digested without trouble, thus giving relief to the intestine long enough for it to recover its tone and digest the ordinary milk foods. These cereal preparations are a most valuable weapon in our armamentarium in chronic gastroenteritis. While milk preparations protract the sufferings of the little patient these preparations give him rest. In the dyspepsia of weaning they are most valuable. The hydrocarbonaceous

régime acts like a charm. In intolerance of milk or milk dyspepsia it is most valuable. There are symptoms of acid intoxication from the decomposition of the casein, which are relieved by vegetable substances. Cereals mixed with nitrogenous substances and put in the oven so as to be artificially digested oppose their effects to the formation of aromatic principles, indol, skatol, etc. They form an antiputrid substance, and prevent putrefaction of casein favoring the production of lactic and succinic acids. Farinaceous materials are slowly transformed throughout the intestine and protect the casein from putrefaction.

Removal from and Return to a Milk Diet in Diarrheas of Infancy.—Rousseau-Saint-Phillippe (*Jour. de Med. de Berdeaux*, May 10, 1908) believes that the last word has not been said on the subject of infant feeding in gastrointestinal diseases of infants. It is necessary to have not only a milk that is clean and that is brought in a hygienic manner to the consumer, but one that still retains all its nourishing qualities. We must remember that cow's milk is not the natural food of the infant and should make use of it as a medicine rather than a food. Some infants cannot tolerate it at all and others, after having gone onto a water diet and been cured of diarrhea, are unable to begin again on a diet of cow's milk. At the same time the vegetable or other foods that have sufficed for a time to keep up nutrition cannot be given for an indefinite period. The author thinks that we should now begin the use of milk very gradually, by the teaspoonful, like a medicine, slowly increasing the amount taken until we have again established a tolerance for it. Milk is not in all cases the perfect, antitoxic, easily assimilable, complete food that it has been considered. The food of the cows should be carefully watched that a good quality of milk may be produced. In cases in which milk becomes toxic it should be stopped at once and the child put on a water diet and some other food. When the intestinal tract has been cleansed, disinfected and brought back to a natural condition it will accept voluntarily the food that was previously toxic provided that it is given slowly in small doses.

Observations on a new Toxin Found in the Urine and Feces of Nurslings.—Walter Gellhorn (*Munch. med. Woch.*, April 21, 1908) records observations on a poison found in the feces and urine of babies which he has called kenotoxin. It may also be found in the muscle-fiber of exhausted animals. When animals have been immunized with kenotoxin they develop in the blood an anti-kenotoxin. Kenotoxin is widespread in nature. Injected into mice, it causes languor, stupor, lowered temperature and death. The author has isolated the substance from the urine of babies and believes that it arises from imperfect metabolism of albuminoids. Twenty-five infants were subjects for urinary analysis, none of whom had kidney lesions discoverable by this analysis. Eight were well, the rest had gastrointestinal troubles. The author believes that where kenotoxin exists there are other

poisons of whose presence this is an indicator. The cause of its production is not yet ascertained.

Relation of Bacilli of the So-called Dysentery Group to Diarrheal Affections of Infants.—J. H. M. Knox (*Arch. of Ped.*, April, 1908) reviews the recent literature of this subject and says that examination of this literature from the laboratory and the bedside, tends to establish certain facts, and explains others which were before doubtful. It can no longer be questioned that the true Shiga bacillus does produce in culture media a soluble toxin, and that an antitoxin is produced in the blood of susceptible animals which is a valuable specific curative agent. It seems also to be true that there are several other closely-related strains of the dysentery bacillus which differ culturally but little from the original type and less from each other, which are almost, if not quite, as pathogenic for laboratory animals, but which do not lend themselves to the production of a soluble toxin, and against which no satisfactory antitoxin has been as yet produced. Children are susceptible to infection by all three forms, but experience heretofore has shown that infants are rarely invaded by the original Shiga variety, and then after definite exposure to the disease in adults, but that strains of the dysentery bacilli, that ferment mannite, are much more frequently found in the widespread diarrheal disorders which affect infants in the summer. It is, of course, recognized that gastrointestinal affections with diarrhea can be brought on by various indiscretions in diet, by mechanical and chemical means, and by other bacteria than dysentery bacilli, and also that some such disturbance frequently precedes infection with the dysentery bacillus. It is true also that the dysentery bacilli may be present in the dejecta of infants exposed to infection, without setting up any disorder until the patient's resistance is lowered. The organism probably has no natural habitat outside the body, and is kept alive by the occasional epidemics and the sporadic cases which occur throughout the year. The virulence of the infection and the character of the pathological changes in the intestines vary greatly. The presence of the pseudomembrane is much less common in children, perhaps because this lesion is especially produced by the original Shiga type.

Symptomatology and Etiology of Barlow's Disease.—Esser (*Munch. med. Woch.*, April 28, 1908) believes that one of the principal causes of Barlow's disease is too long sterilization of milk at too high a degree of temperature. In a series of children observed by him who were fed on sterilized milk from the municipal plant at Bonn several developed scurvy. There were thirteen treated by himself and ten treated by other physicians and fed in the same way. They were from seven to fourteen months of age, and a few of them had taken some mother's milk at first, but had later been fed entirely on sterilized milk. Some of the cases had been diagnosed as rickets, poliomyelitis, etc. There were loss of appetite, pallor, pain and loss of motion of the legs. In

four cases the legs were swollen and misshapen; three had blue gums and hemorrhages in the gums; in two there had been hemorrhage into the orbit and the eyeball was pushed forward, and in four there was hematuria. The use of the *x*-rays showed bone changes in the thighs in those in whom there was swelling. A few had elevation of temperature. Blood-examination showed the hemoglobin lowered, and red blood-corpuscles diminished in number. Poikilo mikro- and makrocytes were found, with few normoblasts. The appearance of basophile cells is regarded by the author as the beginning of regeneration and a favorable sign for prognosis. The milk that was used was sterilized for ten minutes at a high heat. The condition of the children produced is one of chronic poisoning from the changes in the contents of the milk. A change of milk brought about a cure in all these cases.

Infantile Pyloric Stenosis.—J. L. Morse and F. T. Murphy (*Bost. Med. and Surg. Jour.*, April 9, 1908) record the pathological findings in a case of congenital pyloric stenosis which died at the age of eight months of general peritonitis of unknown origin, six and one-half months after a successful posterior gastroenterostomy. A cross section through the middle of the pylorus showed a very thick wall of perfectly normal, smooth muscle. The increase in thickness was due chiefly to the increase in the inner layer of circular fibers. The submucosa was normal and was folded into the lumen. The glands of the mucosa were flattened and dilated with mucus, where the surfaces were in contact between the folds. The flattening and distortion of the glands were best seen in a longitudinal section made through the pylorus between the stomach and the space from where the circular piece was removed. This section showed the folded surfaces of the mucosa in contact. A similar section from the duodenal end showed normal smooth muscle in the thickened pyloric portion and normal submucosa. The mucosa showed very marked cystic dilatation of the glands, which were filled with granular coagulum. The microscopical findings in the pylorus are surprising, because of absence of degenerative changes in the smooth muscle, either in the form of atrophy or in connective tissue overgrowth. The closed state of the pylorus was proved by mechanical tests and by the rigidity and thickness of the walls, which are in striking contrast to the usual post-mortem condition of the pylorus in infants. The flattening of the mucosa can hardly be considered as an evidence of permanent closure. The cystic dilatations of the glands are probably mechanical in origin, though a few similar cysts have been seen in the mucosa of the normal pylorus of infants. This case proves that in some instances, at least, the stenosis is not due to spasm, that medical treatment cannot be of any avail, and that the only hope for relief and life lies in surgical intervention. It also proves that an infant can live and thrive for many months, although all the food passes through the gastroenterostomy opening and none through the pylorus. It suggests that the condition of organic infantile

pyloric stenosis is a permanent one, that there is no tendency toward a restoration of normal conditions, and that there is little hope of the pylorus ever resuming its functions. It is not safe to draw conclusions from these suggestions, however, as it is possible that with the lapse of time and the growth of the parts, changes may occur which will result in the restoration of normal conditions and function.

Cause of Intussusception.—W. L. Wallace (*Jour, Med. Assn*, April 11, 1908) reports the case of a three-year old hydrocephalic boy with spinal curvature who had an attack of obstruction of the bowels with bloody vomiting. Operation disclosed small enteric intussusception and complete sausage-shaped intussusception. He lived about one year and again was seized with the same condition. Early operation showed the blood-vessels of the mesentery blocked and the corresponding segment of bowel badly distended, with the intestine above pushing into it as if to reinforce the weak segment by the invagination. The writer says that there are two theories of the cause of intussusception: spasm and paralysis. The first theory holds that, for some reason, a local spasm is set up in the bowel and a violent contraction takes place, and this point is made the apex of an intussusception by passing into the intestine below or having the bowel below drawn up outside. The other theory is that of paralysis. A certain section of bowel is paralyzed by interference with its nerve-or blood-supply. It, therefore, becomes distended and the bowel above is pushed into it. The author's case is reported as supporting the theory that intussusception is due to paralysis. The strangulation of the blood-vessels was out of all proportion to the condition of the bowel and was evidently the cause and not the result of the intussusception. The intestine opposite the strangulated mesentery was bulged and the gut above was working into it. Repeated observations have shown that the middle tube or layer of the intussusception is edematous and often gangrenous. This is generally attributed to pressure by the outside layer, but the inner tube gets even more pressure, and, therefore, the explanation is unsatisfactory. The writer does not think the intussusception is formed without cause and that the middle tube is then diseased by pressure, but I believe that a portion of the bowel is damaged by interference with its blood-supply, and bulges and is about to perforate, and that the intussusception is the result and is nature's effort to reinforce this weak piece by splinting it between healthy layers from above and below. Instead of being the cause of the obstruction this invagination supports the weakened intestine, often allowing a restoration of the blood-supply, after which nature will reduce the intussusception. On the other hand, if the damage is great and adhesions form, and a reduction is impossible, nature will make an effort to unite the neck of the intussusception to the healthy bowel above, so that there may be no leak when the gangrenous intussusception sloughs away.

Hydrocele in Children.—E. D. Telford (*Med. Chron.*, May, 1908) says that most surgeons are now agreed as to the advisability of the operation for hernia about the end of the first year of life and if this position be accepted for hernia it must logically follow for hydrocele. It will be found that in many cases a distinct funnel-shaped process of unclosed peritoneum exists above the hydrocele. This funnel is a potential hernia and its proper obliteration is an essential part of the operation.

Diagnosis of Scarlet Fever.—G. A. Crowley (*Dubl. Jour. Med. Sci.*, April, 1908) has studied 1005 consecutive cases from the stand-point of diagnosis. He says that during the first stage, which ends with the disappearance of the rash, the chief signs are headache, vomiting and sore throat at the outset with rapid pulse, characteristic eruption and furred tongue. In the second stage, from the time of disappearance of the eruption to that of desquamation, which sometimes occurs before the rash has faded, the chief points to be looked for are: (1) The peeled condition of the tongue, which has not yet had time to renew its epithelium. (2) The appearance of the fauces which, if invasion has been at all severe, will still show some degree of injection. (3) Roughness and dryness of the skin, which is not infrequently of a dirty, yellowish color. (4) The presence of enlarged and injected papillæ on the legs, outer side of thighs and posterior surface of arms. (5) The existence of enlarged and tender glands at the angles of the jaw. In the third stage, peeling of the "pinhole" type, so called because of the appearance of the skin which resembles that of a piece of paper perforated by a pin from the opposite side, is such a constant phenomenon and so distinctive that one is justified in ascribing to the toxin in scarlet fever a special and selective action on the skin which, in addition to the more general factor of hyperemia, determines this peculiar form of desquamation. Further evidence to be sought for at this stage in suspected cases is the presence of one or more of the commoner complications—*e. g.*, otorrhea, simple albuminuria, cervical adenitis or acute nephritis. The writer advises a search for evidences of desquamation, indicating scarlet fever whenever called upon to treat one of these conditions. In septic scarlet fever the serious symptoms are caused by a mixed infection with staphylococcus pyogenes, etc., at the onset or later. In this the rash is often hemorrhagic, the glands of the neck are much swollen and tender and finally suppurate, the tongue and mouth may be ulcerated, the throat greatly inflamed and ulcerated, the temperature high and of septic type. Pyemia may follow. In toxic scarlet fever the fatal issue is due to an overpowering dose of the scarlet-fever toxin, and the symptoms from the outset are those of severe toxemia without secondary infection.

Mode and Duration of Contagion in Scarlatina.—Zilgien (*Jour. de Méd. de Paris*, May 16, 1908) advocates the view that scarlatina is not contagious by means of the cutaneous scales, but by the expectoration from the throat during the period of

angina. In cases in which there are adenoids, enlarged tonsils, suppuration of the middle ear and such complications, he finds that the contagion exists for a long time after the disease appears to be entirely well, while in other cases the contagion seems to pass over with the disappearance of the sore throat, in spite of the occurrence of the profuse desquamation. The author believes that the streptococci are preserved in their virulence in the diseased structures of the throat or middle ear long after convalescence is established. To substantiate these views he relates the case of an adult who had a severe angina without any rash and had a relapse a week or more after quarantine was raised at the disappearance of the sore throat. He did not communicate the disease to any one, in spite of the fact that he peeled profusely for some weeks. In a school under the author's observation an epidemic occurred in which one girl seemed to be the source of contagion to a number of others. No case appeared except when the child had been in contact with this girl, and this went on for two or more months. The author believes that the necessary prophylactic measures involve careful disinfection of the throat in all cases and of pencils and other materials that have approached the patient's mouth, such as towels, handkerchiefs, etc.

An Unusual Location of the Klebs-Loeffler Bacillus.—Francesco Cenci (*Riv. di Clin. Ped.*, March, 1908) describes a case of vulvitis in a child, which had proved obstinate for some time. There appeared over the swollen vulva a membrane, the examination of cultures from which showed the presence of the Klebs-Loeffler bacillus. There then appeared a diphtheritic infection in the throat of the same child, which recovered under antitoxin. The mother and a second child both suffered from diphtheria and the child died.

Serotherapy in Diphtheritic Lesions of the Kidneys.—Alfredo Villa (*Riv. di Clin. Ped.*, March, 1908) advocates the use of antitoxin for the relief of the kidney symptoms following diphtheria, notably albuminuria. He refers to the opposition that has been shown by the profession on the ground that the serum has no effect on the nervous or kidney manifestation of diphtheria. He gives the histories of the cases of albuminuria treated by himself with antitoxin with cure. The presence of albumin in the urine is simply an expression of the severity of the intoxication. The earlier the injections of antitoxin are given, the less are the number of cases of albuminuria. The albuminuria in diphtheria appears relatively early in the disease, the second to the eleventh day, and is very rebellious to the different forms of treatment. There are found lesions of the epithelium of the tubes, especially the convoluted tubes and ascending limb of Henle's loop. In cases in which albumin appears in the urine, the author injects from 1000 to 2000 units of antitoxin, according to the age of the child, and repeats the injection the following day. He finds that the treatment accelerates the disappearance of the albumin from

the urine. It is most efficacious in those cases in which albuminuria persists late in the disease. In these the antitoxin is all counteracted by the poison, and then a fresh explosion of the disease may occur. Here the renewed injection of antitoxin prevents the kidney lesions becoming permanent. It gives the organs the opportunity to recover by removing the newly-formed poisons, immunity against the toxins lasting only about three weeks.

Nocturnal Enuresis.—In a paper on the etiology and treatment of this condition, J. W. Russel (*Hospital*, May 9, 1908) mentions a number of cases in which the incontinence was apparently controlled by the administration of about two grains of oxide of zinc at bedtime or twice or three times a day. While other cases showed no improvement under this treatment, he considers it worthy of trial, as other drugs have proven even less successful.

Family Epidemic of Rubeola.—P. Aubert (*Lyon Med.*, May 1, 1908) records an epidemic of rubeola occurring in a family, the branches of which were widely separated from one another. This disease is somewhat rare in France. A single case infected five others, two of which went to different localities in the city, while three remained in the country. The two who went to the city infected five others. There were ten cases in all, of whom four were adults. The disease was characterized by a low fever, absence of nasal and ocular catarrh and cough, presence of slight sore throat, and enlargement of the cervical glands. The prodromal period was very short and the incubation from fifteen to twenty days. The adults suffered most severely, the children being slightly affected. The eruption is difficult to differentiate from that of measles. It is uniformly distributed, of a rose color, in raised points that are not arranged in crescents and are separated by clear areas. The chief diagnostic points are slight fever, short prodromal period and absence of catarrh.

Pathology of Tuberculosis in Children.—John McCrae (*Arch. Ped.*, April, 1908) says that it is probable that the average human being can overcome an infection of bovine bacilli more easily than that of human bacilli; nevertheless, it is certain that a number of bovine infections occur. There is a type of infection in children which we call "bovine," viz., a slowly-progressive tuberculosis, tending to much overgrowth and to dry caseation which affects mainly lymph-nodes anywhere in the body. To-day we can, at times, isolate from such foci bacilli that have the distinctive cultural characteristics of the bovine form, and the bovine grade of virulence toward animals of the laboratory. He does not feel prepared to accept that infections are necessarily bovine, as has been suggested, because he feels sure that the individual resistance is a greater factor than the bacterial variation of virulence in producing those cases of apparently atypical course. So, too, in cases of tuberculosis in children, where the lymph-nodes seem to be the main seat of disease, we malign the resisting powers of such a child, the concentration of

disease in lymph, nodes may be but a mark of the tremendous fight the lymphoid tissue is making, and perhaps the universally tuberculous nodes are but another expression for a generalized miliary tuberculosis, but one that has been countered by a better resistance on the part of the child. The widespread miliary condition may be long postponed by this same "tendency to enlarged glands." The question remains obscure as to how the bacteria actually pass the surface of the pharynx, bronchus or intestine. Few believe that a lesion is necessary. Some bacteria may adhere to fat droplets and be engulfed by phagocytes; small colonies on the surface may exert an eroding action on the mucosa by their toxins. Possibly the young mononuclears, so numerous in childhood, may be more avid to take up tubercle bacilli than are their successors.

The Tuberculin Reaction and its Diagnostic Value in Infant Tuberculosis.—Olimpio Cozzolind (*Riv. di Clin. Ped.*, February, 1908) believes that he has established the value of the tuberculin reaction obtained by injection of Koch's old tuberculin in infants. He has injected forty-seven infants, with twenty-one positive results, obtaining a febrile reaction which has varied somewhat in severity and the kind of elevation of temperature obtained. In most cases there was a quick rise and fall of temperature, but in some the reaction was slower and more enduring. No bad effects are to be expected if the proper precautions are made use of. In suitable cases the reaction is to be preferred to the less reliable ophthlmo-reaction of Calmette.

Channels of Communication of Tuberculosis.—S. Mc. C. Hamill (*Arch. Ped.*, April, 1908) discusses a number of recent articles on this subject and concludes that it is impossible to gain any knowledge as to the port of entry either from the location or the degree of development of the tuberculous lesions. Fetal infection is proven but not common. Infection through the mouth, tonsils and pharynx is of frequent occurrence and may be produced by inhalation or ingestion. Primary inhalation infection through the lungs does occur, and infection through the intestinal tract is definitely proven. The bronchial glands and lungs may be infected through the intestinal tract as well as through the lower respiratory tract. The relative significance of the various modes of infection is very difficult to determine, on the basis of our present knowledge, since it has been clearly shown that it matters not from what point the tubercle bacillus is introduced, it can eventually reach the bronchial glands and lungs without leaving any evidence of its mode of entrance. It is probable, however, on account of the greater exposure of these portions of the body, that infection through the upper respiratory and alimentary tracts is the most common, and next to this, for similar reason, through the lower respiratory and intestinal tracts. As to which of the latter two constitutes the more frequent channel, it would seem that the nature of the exposure should prove a determining factor. If infection occurs when the bacillus is in-

roduced with the food or carried to the lips and mouth in kissing, or by infected hands, nipples, toys, drinking cups, or the various feeding utensils, it must almost certainly be by the alimentary tract. If, on the other hand, the bacillus-laden dust or droplets are inspired, they may be conveyed directly to the lungs and there produce pulmonary and bronchial gland infections. In infants and children, exposure to the former group of conditions is much greater than in adult life, and since we must admit that the greater portion of inhaled bacilli find lodgment in the upper air passages, from which point they may be swallowed, and since infection by the intestinal tract has been absolutely determined in children, as well as experimentally in animals, we can safely conclude that intestinal infection in early life is more common than in later years and that infection by the intestinal tract is more common in infants and children than infection through the lungs.

Inherited Syphilis a Factor in Etiology of Mental Defects.—G. E. Shuttleworth (*Brit. Jour. Child. Dis.*, April, 1908) quotes the reports of 2380 cases in two asylums, in which the histories were fairly well ascertained, and in which evidence of the existence of syphilitic taint could not be ascertained in more than 1.7 per cent. of the patients, and the figures of Tredgold concerning 150 juvenile "aments" in metropolitan asylums, in which he was able personally to investigate the family histories, and found among that number only 2.5 per cent. in which syphilitic taint was manifested by characteristic signs, and 3 per cent. in which it was possible on the ground of ascertained parental infection, though the children themselves showed no specific physical stigmata. He thinks, however, that inherited syphilis is a more frequent factor in the production of mental defect and abnormality in childhood that can be demonstrated from institution statistics and agrees with Fournier that many cases of impaired mental development, such as are met with in children relegated to special schools, have their origin in an inherited syphilitic taint, normal brain development having been interfered with by osteitis causing cranial thickening, by meningeal indurations or by localized cerebral sclerosis. To discover the existence of syphilitic taint a careful scrutiny, not only of parental history, but also of brothers and sisters, may be necessary.

Juvenile Tabes Dorsalis—Ernest Jones (*Brit. Jour. Child. Dis.*, April, 1908) says the most probable features distinguishing the symptoms of juvenile tabes from those of adult seem to be the early and frequent appearance of urinary incontinence, of headache and of amblyopia, the comparative rareness of girdle pains and the late onset of ataxia which is usually little marked. Of the chief features which distinguish juvenile tabes from other affections that resemble it, especial stress is to be laid on the Argyll-Robertson pupil, the loss of the Achilles jerk, followed by that of the knee-jerk, primary optic atrophy of a characteristic type, the typical lightning pains, and the presence of lymphocytosis and excess of albumin in the cerebrospinal fluid.

Sydney Stephenson (*Lancet*, May 16, 1908) contributes to the literature of this subject the clinical reports of five cases. In his opinion, the association in a syphilitic child of bilateral simple optic atrophy, with loss of knee-jerks, points to a provisional diagnosis of juvenile tabes dorsalis.

Congenital Syphilis in Infants.—George Carpenter (*Brit. Jour. Child. Dis.*, Feb., Mar., April, 1908) speaks of the lack of general recognition of the fact that a child may present, instead of the classical "snuffles" with anterior nasal discharge, a chronic snuffles localized in the posterior part of the nasal cavities and nasopharynx, the discharge passing unnoticed into the stomach. The local treatment of chronic "snuffles" by nasal applications is most necessary. Infants with blocked nostrils cannot take sufficient nourishment or properly inflate their lungs, and the dangers of sepsis from the nose and nasopharynx are by no means to be ignored. The writer says that the common situation for craniotabes is behind the parietal eminences, and in 95 per cent. of the craniotabic cases the parietal bones are attacked. In 60 per cent. the parietal bones are solely involved, and in less than 3 per cent. the occipital bones. Other cranial bones are occasionally involved, but he has never seen the frontal bone alone affected. He has no confidence in the rachitic origin of craniotabes and always suspects syphilis in such cases. He also considers Parrot's nodes as a syphilitic manifestation and not one of rickets, it being allied to the periostitis found in the long bones. He has looked upon syphilis as a producer of rickets, but says he has no sound clinical justification for doing so. During the "rickety age," splenomegaly is common. The author doubts whether such splenic enlargement is due to rickets. He holds that at this period there are other agencies besides syphilis and rickets to account for splenic enlargements, of which we at present have no knowledge. It is daily brought prominently to our notice that the spleen is very sensitive and readily responds to a variety of known infections; thus tuberculosis, typhoid, pneumonia, whooping-cough and so on will all bring about swelling of that organ, and there must be other unknown infections with like spleen-swelling propensities, if only for the reason that the known infections are not sufficient to account for all the cases of splenomegaly that arise in infancy and early childhood. No harm can be done, however, by regarding such splenic enlargements as syphilitic. What has been said of the spleen in regard to congenital syphilis applies equally to the liver. Syphilitic nephritis in infants is important, especially on account of its remote possibilities. It may be either parenchymatous or interstitial. The author speaks of syphilis as an explanation of some cases of fetal cardiac disease. Some cases of infantilism he ascribes to double syphilitic orchitis or in females to syphilitic atrophy of the ovaries. Among the rather rare diseases of the nervous system in infants due to syphilis, he mentions meningitis, yellow softening of the brain, endarteritis, gummata of cranial nerves and hydrocephalus.

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ORIGINAL COMMUNICATIONS.

A GLANCE OVER THE DEVELOPMENT OF THE TECHNIC
OF MODERN GYNECOLOGICAL OPERATIONS*.

BY

AUGUST MARTIN, M. D.,

Berlin, Germany.

THE honor of being able to address this meeting I appreciate the more as it has been my sincere desire since this society conferred upon me its honorary membership in 1888. Some forty years I have been in close contact with my American confrères; at that time it was my good fortune to meet several of your most prominent representatives, Marion Sims, Emmet and Gaillard Thomas. Since those years many more distinguished Americans have been added to this number. Twenty-one years have elapsed since my visit at the meeting in Washington and that I am with you again today means that my greatest wish of the past years is to be fulfilled.

In this comparatively long period of time gynecology has experienced an unexpected and magnificent development. One could well suppose, that along with the entire medical science, gynecology, too, would be subject to fundamental change. In view of this, we must gladly confess, that every day discloses to us new and fascinating prospects. New perspectives loom up. Participating in the work of research, we feel urged to further collaboration; it is a pleasure to live and stand in the midst of this activity.

Nowhere does this fact become more evident than at our society

*Read at the 33d Annual Meeting of the American Gynecological Society May 26 to 28th, 1908.

meetings, where, face to face, we give an account of our scientific doings, and in the most ardent manner take up the results of the research work of our collaborators. Such thoughts filled me as I received your call to be present at this meeting. Your programme includes a number of very interesting contributions to the questions that are at the front today. I look forward with enthusiasm toward our transactions and am counting upon receiving much instruction.

In this connection, while glancing over the development made along the line of work during the past five decades, I became especially interested in finding out the various turns *gynecological treatment* has taken. Fifty years ago, the work of the gynecologist was limited to medical and orthopedic applications to the vulva and vagina and the collum uteri. One was more or less timid about entering the cavity of the uterus. After Sir James Simpson and E. Martin had made the discision of the narrowed os uteri, an essential step forward was noted, as well as in the employment of the *écraseur* of Chassaignac and the use of the electric cautery. During this time also, especially after Atlee, Peaslee, Spencer-Wells, Baker-Brown, Koeberlé and Keith had met with remarkably good results, abdominal neoplasms, being more exactly recognized, were attacked by laparotomy with more confidence. It was reserved for Marion Sims, however, as well as for Gustav Simon and Hegar to lay bare the vault of the vagina, and inaugurate the plastic work on the collum and the vagina. Emmet's trachelorrhaphy and the successful fistula operations of Simon and Bozeman appeared as triumphs at this stage. Intrauterine treatment was improved by the use of sponge tents in dilating the cervix and thus opening up the cavity of the uterus. In this way, after continuous efforts, the mucosa could be reached, curetted and medical treatment applied.

The next step forward was in abdominal surgery. We not only operated upon true neoplasms as did Koeberlé and Keith, Pean, Hegar and Karl Schroeder, but also upon inflammatory masses. Lawson Tait, Hegar and I proved at that time the possibility of achieving satisfactory results by abdominal operation in cases of oöphoritis and salpingitis. It was at that period we learned to our great surprise that many of these supposed inflammatory masses were due to the ectopic location and growth of a fertilized ovum.

In the meantime W. A. Freund had found a way, by means of a combination of the abdominal and vaginal methods of operation

to extirpate that most fatal malady, cancer of the uterus. It is true that in the beginning the results of this method of operation did not equal what was expected therefrom. Freund's operation, however, led the way; later, first at the proposal of his former pupil, Emil Ries, in the past ten years it has been enlarged so as to include the pelvic tissues and retroperitoneal glands. This procedure is considered today the typical carcinoma operation.

Freund's advance gave an impetus to extirpation of the carcinomatous uterus by means of the vaginal route. Czerny, Billroth and Schroeder have lead us along this way. A mighty step forward was taken. By means of the vaginal separation of the uterus we have learned, in cases of non-malignant disease of the uterus, not only to extirpate vaginally the adjacent organs, but also in certain cases to preserve them after the diseased parts have been removed; atretic tubes are opened up, partly diseased ovaries resected and the healthy remainder conserved. This advance marked the beginning of conservative operations in gynecology.

A further step was the treatment by operation of deviations of the uterus which before that time had been given only orthopedic attention. The ideas of Sanger and Olshausen opened up a wide field of operative activity for uterofixation. It was only when experience began to prove the late definitive results, that the Alexander-Adams operation began to be much more widely used, and pushed the ventral fixation into the background. The rapidly increasing frequency of laparotomy for this purpose was somewhat interfered with by Dührssen and Mackenrodt, when they showed at the beginning of the last decade of the nineteenth century that there was a safe vaginal method of exploring the true pelvis and all of its organs.

It almost seemed for some time that the abdominal operation should be limited to large tumors in the peritoneal cavity. After a few years a reaction set in, especially as far as extrauterine pregnancy was concerned, and then as regards the inflammatory diseases of the adnexa. This occurred in spite of the advantage gained by the median vulvo-vaginal incision of Dührssen, and especially of the lateral incision of Schuchardt, the cicatrization of the latter showing better results than the former. Both of these incisions give a satisfactory exposure of the vaginal pouch and a free route to the pelvic organs.

It is, no doubt, evident that in the course of the present century the enthusiasm for vaginal operation has subsided, so that

today, even such confident advocates as Mackenrodt have withdrawn from it and use the abdominal method in the majority of cases. This glance shows that the operative technic has undergone a peculiar undulation. After a short period during which the vaginal operation was highly favored, laparotomy came into use until further improvements were made along the line of the vaginal technic. Again laparotomy took the lead, and by its victorious advance, the vaginal operation is placed on a most modest basis today.

We ask, in view of this, what have been the conditions allowing gynecological operations to develop to such a degree? The way was prepared by getting a closer insight into pathological anatomy. This gave a basis for improving the diagnosis. B. S. Schultze, the Nestor of German gynecologists, did much toward its development, and secured for himself a meritorious place along this line of work. We have learned to differentiate the process before a tumor distends the abdominal wall, and before the entire true pelvis is blocked by the diseased organs. Following the counsel of Karl Ruge, we obtain pieces of the mucosa of the uterus and build up a diagnosis from its microscopic examinations. In addition, today biological-chemical methods assist us, so that by culture and inoculation, by blood-investigation, by a study of the secretions and excretions, we are able to get far into the field of diagnosis. We dare not forget, however, that there is yet wide extension necessary in the methods of investigation. It is in this very field that there is much work yet called for. On the other hand, many a question is open; for example, how far are genital disorders responsible for those of the urinary system and the appendix, how far may the views of Hegar and Freund, as to the significance of infantilism, about which until today we know so very little, be correct.

We must thankfully acknowledge that our activities would never have reached such extension if antisepsis had not been replaced by asepsis. You all have witnessed this development; we all so thoroughly agree in honoring Holmes and Semmelweis, Pasteur, Koch and Lister, that one needs only to mention their names. The result of their labors is seen everywhere, and its benefits extend to all departments of medicine. We, as gynecologists, it must be acknowledged, in our efforts have done a good deal toward aiding the work along this line. In the course of the development of our operative technic, we are beginning to see a rich harvest before us. Sufficient up-to-date material is now at

hand to study not only the primary results of our operations in large statistical collections, but to state also whether the results be permanent or not. We cannot deny that this testing of results brings us many disappointments. In this way many defects and false conclusions have been pointed out to us, which seriously invite criticism of our own work and prove it with renewed energy.

If in such a critical manner we examine our operative technic of today, laparotomy claims the preference over the vaginal method, on account of its bringing before us with greater clearness the pathological conditions of the whole peritoneal cavity. That is certainly to be admitted, even though the vaginal method as it appears in its development today, and as far as localized processes go, leaves nothing to be desired in the way of a wide opening in the pelvic floor to the space below the pelvic brim.

Until not long ago the most powerful claim against an abdominal operation was raised on account of the great danger to life connected with it as shown by statistics and also on account of the number of complications following it.

It is without further discussion to be admitted that in reference to the first of these disadvantages, namely, the high mortality, essential advance has been made. When we compare our aseptic measures of today with those previously used, we will at once notice the vigorous stand assumed today toward septic infection. The danger of sepsis in laparotomy increased in proportion to the amount of exposure of the peritoneum to pathogenic organisms: it is being universally attempted to shorten the operation as much as possible. At the same time, the injurious effects of narcosis are considerably lessened, and care in upholding the resisting power of the patient shows decided and evident results. Furthermore, the safe healing of the incision is insured. The incision, as practised by Pfannenstiel indubitably protects remarkably against stretching of the incision.

This we freely admit. Experience has taught us, however, that these scars are not absolutely guarded against serious stretching. Even with perfect asepsis and primary healing of the incision, the physiological processes (pregnancy, climacterium) which belong to the physiology of the female body render these scars objects of tension. If on account of some accident or some unknown reason, the healing is not effected *per primam*, the question of cicatricial extension looms up in a more alarming manner. While it is true that the master operators have long series of per-

fect healings, even they cannot feel certain that there may not be some infection of the abdominal incision, and this danger increases if the operation is upon inflammatory structures. This is present in all those cases where drainage of the field of operation is called for. In addition, another complication is to be considered as a most serious one, endangering the late results even after ideal primary healing of the incision and after a perfect primary convalescence. I refer to the terrifying frequency of adhesions of the intestines and of the omentum to the abdominal incision as well as to the stump from which the tumor has been removed. These adhesions and the significance of their consequences have been demonstrated to us by the observation of our patients for many years. No modification in our methods is at hand to cause them to disappear with certainty; neither the careful handling of the peritoneum during the operation, nor the so-called "peritonealizing" of defects, nor the attempts of influencing the peritoneal layers by bringing oily substances or salt solution in contact with them, nor the early action of the motus peristalticus counteract these complications to any satisfactory extent. They will be a constant source of danger in a laparotomy, at all events more so than in a vaginal operation. Of course, the pelvic organs are not in any way insured against the formation of similar adhesions, but if I may speak from my own experience, they occur hereby very much less frequently.

The formation of a scar in the pelvis follows with such regularity, that an exception becomes very marked. Continuous ulceration of such an incision is extremely seldom, even when it is necessary to drain an infected region. Late complications, such as hernia, are extremely rare. Also in the vaginal operations, beyond question, at times, pathological organisms ooze over the field of the incision; as a rule, however, encapsulation rapidly sets in, and the drainage through the vagina is sufficient and effectual.

Certainly vaginal operations require a special training; I might say, a more minute operative experience. It is not always so easy to expose the vault of the vagina and to force our way to the peritoneum in order to view the pelvic organs. The advantages gained, however, are a sufficient return for the pains taken, even more when we consider that after a vaginal operation the patients quickly get on their feet again, quite as soon as after a normal birth; earlier than after the most simple and bloodless and aseptic laparotomy.

That the modern method of narcotizing does not necessitate a difference between the two methods need be only mentioned here, so that the convalescence from none of these operations demands a long dorsal posture. The sooner the patients move about and then leave the bed, the more certainly are avoided the dangers of a long dorsal posture upon heart and intestines.

That the vaginal method can come in consideration only for a limited field of gynecological affections is to be acknowledged; but no one is entitled to say that tumors of the uterus and ovaries should be approached only by the vaginal method as long as they are situated in the true pelvis. I do not know of such a limitation. The boundary does not depend upon whether the tumor lies in the pelvis or not; it depends upon its movability. Even very small tumors which are firmly adherent should not be attacked by the vaginal route. On the other hand, much more voluminous masses can be operated upon vaginally if their peritoneal surface is not adherent to neighbouring organs, as their size can be diminished either by morcellation or puncture. In some cases, indeed, according to von Ott's method, these adhesions can be readily exposed to view so that they can be separated; as a rule, I consider such adhesions as a counter-indication. To be sure, even very firm adhesions may escape our diagnosis before the operation; nevertheless, a careful taking of the previous anamnesis often points to a previous peritonitis. We learn by riper experience to find these adhesions as well by touch as by their sensitiveness. And if in a vaginal operation we do unexpectedly meet with such adhesions, what hinders us from discontinuing it and ending with an abdominal section? Only now and then have I been compelled to do this; there was no injury to the patient from such a procedure.

Treating the deviations of the uterus by vaginal operation has resulted in serious disorders in pregnancy and parturition. When the fixation is made in the lowest part of the corpus, this fully develops when pregnant and acts normally in parturition as a large number of instances have proved.

No plan for restoring the normal seems to be free of failure, but none gives a smaller cicatrix from which disorders may result. The vaginal route seems to come today more in favor as following the advice of Kiefer, Gebhard and many others; the shortening of the round ligaments can be performed with complete safety through a vaginal incision.

An important advantage of vaginal operation is given by the

frequency of coexisting diseases of the uterus, of the adnexa and peritoneum and of the vagina and the perineum. This fact has gained remarkable significance, since not only the uterine displacements, but also the inflammatory diseases of the tubes and ovaries, and especially the ectopic insertion of the ovum do give us an indication for operation, I might say almost daily.

This consideration seems particularly indicated for the treatment of retroflexion, combined as it is in the majority of instances with procidentia of the vagina, cystocele and rectocele, and the loss of the perineum.

The procedures advocated by Freund, Wertheim, Schauta and others for extreme prolapse of all the pelvic organs, and especially to support a prolapsed bladder by means of the uterus turned upside down and placed under the bladder, furnish a wide and significant increase to the existing indications for vaginal operations.

Our views as to the treatment of the inflammatory condition of the tubes and ovaries have been thoroughly changed within the last few years, since better knowledge of their etiology and significance has been obtained. Much more frequently than was formerly acknowledged, gonococcus infection involves the tubes and peritoneum. Under proper treatment, healing commonly takes place and so complete may this be that full functional activity is regained. We have likewise a better knowledge of the conditions underlying septic infections and tuberculosis. Only a minority of these cases offers an *indicatio vitalis*. Very frequently we find healed processes of this kind a long time after the first stages of the disease have passed, when a recent disease is met with or some recurrence of the old one requires operation. In such cases we find dried up pus, which proves to be sterile. Thickenings and adhesion indicate beyond question what serious processes have gone on sometimes many years before. In the meantime patients have enjoyed apparently perfect health. Such cases, aggravated even by repeated serious recrudescences, heal undoubtedly very frequently and completely without operation. Such observations compel us to consider most earnestly as to whether it is right to remove these inflamed organs as long as there is no immediate danger of life. In fact, very frequently patients recover without operation in spite of gonorrhoea, tuberculosis, puerperal fever or septic infections from plastic operations.

Whether it is more advisable to operate during the acute feverish attack "*à chaud*," abdominally or vaginally is a question

that has been much discussed. In recent years I prefer the vaginal method for operating on such fresh inflammatory cases of salpingitis, cōphoritis as well as para- and perimetritis. I open by vaginal incision in order to drain through the vaginal vault, reserving laparotomy for general peritonitis. Such patients not only recover so far as relief of symptoms is concerned, but I have in a number of instances observed subsequent pregnancies and perfectly normal puerperia. The larger number of these cases come to observation in the stages between the acute attacks. In such we decide upon operation when general and medical treatment directed toward resorption have failed. Less voluminous masses without very dense adhesions can be readily removed by the vaginal route. Large masses and those in which the question of adhesions cannot be definitely settled by examination before operation, are to be removed by the abdominal route.

Varying indications are met with in the course of development of tubal pregnancy. Cases in the advanced stage, when the pregnancy has extended over a period of about three months, should be treated abdominally. In earlier stages, unruptured extrauterine pregnancies can be safely attacked vaginally. It is disputed as to which course to pursue when rupture has occurred. Here we must determine whether a hematosalpinx (sactosalpinx haemorrhagica) has formed or a hemocele. I have safely operated upon the former by the vaginal method when the tumor was larger than a fist and in cases of the latter also when the blood appeared to be encapsulated. The control of the hemorrhage, the removal of coagula and sac can be performed by the vaginal method with complete safety. Basing all operation upon the principle of removing only parts which are proved to be irrecoverably diseased, in some cases of hematosalpinx the tube can be emptied by longitudinal incision and this incision can then be closed. I concede, however, that under unfavorable circumstances, as lack of sufficient operative routine, and where assistance is unsatisfactory in the house of the patient, laparotomy allows us to care for the bleeding tube rather easier and quicker; and this is to be our first consideration when hemorrhage threatens the life of the patient.

Recently, Schauta has given a wider perspective by operating upon cancer of the neck of the uterus by means of a very extensive vaginal operation. He reports splendid primary and permanent results, based on a large material. The extirpation of the para-

metrical connective tissue can be safely accomplished in this way. Schauta does not attempt to remove the retroperitoneal glands. It is true that by doing so he diverges from the present-day view of surgeons—removing any gland within reach in cancerous outgrowth. Schauta depends upon the fact that enlarged retroperitoneal glands excised in cancer cases have proved only in a minority of instances to be cancerous.

I have attempted to give a fair view of the abdominal and the vaginal route. I fully appreciate the difficult position of the latter; its dominion is limited. It requires a special routine in diagnosis and a particular training for operation. I perfectly know that in this country quite exceptional attention is paid to the appendix, which you remove far more frequently than we do.

I hope that you will consider these remarks based upon intimate consideration of the subject. In case you resolve to give to vaginal work once more a fair chance, I dare hope that, meeting some years later, many of you will agree with me in valuing it higher than is usual today.

IS PUBIOTOMY A JUSTIFIABLE OPERATION?*

AN AFFIRMATIVE ANSWER BASED UPON A PERSONAL EXPERIENCE IN THIRTEEN CASES.

BY

J. WHITRIDGE WILLIAMS, M. D.,

Professor of Obstetrics, Johns Hopkins University, Obstetrician-in-Chief,
Johns Hopkins Hospital.

At our last meeting, Fry read a paper entitled "Pubiotomy in America," which was based upon twenty cases, including seven performed by me, and concluded that the operation had only a limited sphere of usefulness and should be employed only when Cesarean section was contraindicated—after failure to deliver with high forceps or in an exhausted or infected patient. Likewise, Berny, after critically studying the twelve cases which had been reported in France up to the end of 1906, held that pubiotomy possessed but few advantages over symphyseotomy, and that time only could show what its future may be. On the other hand, the subject was the main theme considered at the German Gynecological Congress in 1907 and gave rise to a most extended and interesting discussion, the general consensus of opinion being that it was a most valuable operation and one destined

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to revolutionize the conservative treatment of labor complicated by contracted pelvis.

Since February 13, 1906, thirteen pubiotomies have been performed in my service, and I report my experience in the hope that it may aid some of us in determining whether the procedure is a justifiable one. I shall therefore discuss, in the order given, my own results, the technic of the operation, its various complications and finally its indications.

My Results.—Upon analyzing the cases, nine of which were operated upon by me and four by my assistants, it is found that there were no maternal and three fetal deaths, although, as will be shown later, only one could fairly be attributed to the operation. (For full details the reader is referred to the list of cases at the end of the article.)

The following varieties of deformity were encountered: six generally contracted rhachitic, two flat rhachitic, two generally contracted and three funnel-shaped pelves. In the first ten pelves the conjugata vera varied from somewhat less than 7 to 8.5 cm., while in the three funnel pelves the transverse diameter of the outlet measured 7 cm. It should be noted that in the case histories I have given only the length of the diagonal conjugate, from which the true conjugate may be estimated by deducting $1\frac{1}{2}$ or 2 cm.

With the exception of Cases VII and IX, the operation was not undertaken until after the patient had been in the second stage of labor for from two to ten hours, and then only when advance of the presenting part failed to occur in spite of strong expulsive pains. In every case the vulva was dilated manually before beginning the operation, and the saw placed in position by Doederlein's technic, except in Case I, in which Gigli's open method was employed. As the operation was not undertaken prophylactically, but only after it had become apparent that spontaneous labor could not occur, delivery was effected immediately after severing the pubic bone, forceps being employed in ten, and breech extraction in three instances.

In most cases there was a moderate amount of hemorrhage following section of the bone; but in Case V, which was associated with a deep communicating vaginal tear, it was quite profuse, and vigorous treatment was required to overcome the resulting shock.

Injury to the soft parts occurred less frequently and was less extensive than many of the reports would lead one to expect, notwithstanding the fact that nine of the thirteen patients were

primiparæ. Fortunately Case V was the only one in which the vagina was injured, but in this instance a deep tear, extending up the left side from the outlet nearly to the cervix, communicated directly with the pubiotomy wound. This occurred during the extraction, through an 8 cm. generally contracted rhachitic pelvis, of a 4050-gram child, which presented by the breech. In cases XII and XIII slight tears occurred in the vestibule, but did not involve either the vaginal outlet or the urethra.

Considering the fact that nine of the patients were primiparæ, perineal tears occurred but rarely, being noted in only three instances. In Cases III and VIII they were of the first degree, and required respectively but one and two sutures for their repair. In Case V, to which reference has already been made, the deep communicating vaginal tear was associated with a perineal laceration of the second degree. This, however, could scarcely be attributed to the operation, as it followed the breech extraction of a large child and might readily have occurred with a normal pelvis.

The bladder escaped injury in all cases, and at no time was the urine stained with blood. Catheterization was required for some days in cases V, VIII and XII, while in cases XI and XIII it was necessary upon one or two occasions during the day of delivery.

Following the birth of the placenta, wounds of the vagina or perineum were repaired when present and all healed satisfactorily. After closing the upper pubiotomy incision with interrupted catgut sutures and generally introducing a small drain of iodoform gauze through the labial opening, a broad band of adhesive plaster was passed around the patient's hips and served to immobilize the pelvis to some extent. Upon returning the patient to bed, she was placed upon a Bradford frame in order to facilitate handling, particularly during urination and defecation. The frame was uncovered for twelve or fifteen inches, corresponding to the situation of the buttocks, so that upon elevating its lower end the genitalia became readily accessible for cleansing without seriously disturbing the patient. Except in the first few cases, no attempt was made to immobilize the patient who was encouraged to move upon the frame as soon as she felt so inclined, and accordingly she usually began to lie upon her side within a few days after the operation.

It must be admitted that the course of the puerperium was not as smooth as might be desired, as in only six cases did the

temperature remain below $100\frac{1}{2}$, while in the other seven it varied between that point and $102\frac{1}{2}$. None of the patients presented signs of serious infection, although Cases IV and V were quite sick, the former presenting considerable abdominal distention for several days, which disappeared as soon as the bowels moved satisfactorily, while the latter was the patient with the deep communicating vaginal tear.

On the other hand, most of the patients complained comparatively little and were far less troublesome to care for than the reports of several American writers would indicate. Thus my head nurse, who is a very intelligent observer, tells me that the after-care in such cases is somewhat more troublesome than with Cesarean section, but that the patients give rise to far less anxiety.

As soon as the woman has overcome the entirely natural feeling that she may burst open upon the slightest exertion, she will allow herself to be turned upon her side, and within a few days will move freely on the Bradford frame. Thus one patient in the absence of the nurse got out of bed on the fourth day without injury to herself. Ordinarily, somewhere about the tenth or twelfth day the patients ask to be allowed to sit up, and a few days later are ready to leave their bed. With the exception of Case I, who was kept in bed for twenty-nine days as a matter of precaution, the other women were allowed to get up at periods varying between the sixteenth and twenty-third days. They began to walk almost immediately and were discharged in good condition between the twenty-fifth and thirty-seventh days; it being found on an average that they got up on the twentieth and left the hospital on the thirtieth day.

At the time of discharge, locomotion was very satisfactory, although several patients suffered from a slight limp, which soon disappeared. Ten of the women were seen later and reported that they were perfectly well in every respect and were able to work as hard as before the operation.

The findings at the site of the bone wound were most surprising. In somewhat more than one-half of the cases more or less callus was felt upon the anterior surface of the pubic bone, while in the others no trace of it could be found. On the other hand, the posterior surface was invariably smooth and no trace of the section could be discovered upon vaginal examination, except occasionally for a slight notch upon the upper and lower margins of the bone corresponding to the ends of the incision. That heal-

ing did not occur by bony union was shown by the fact that in four cases the cut ends of the bone could be felt to move upon one another when passive movements were imparted to the thighs. Except in Case I, no injury was done to the sacro-iliac joints, but in that instance a somewhat prominent and sensitive swelling was felt in front of each joint at the time of discharge, so that the promontory of the sacrum appeared to lie in a depression. This caused the patient no inconvenience and had disappeared when she was examined one month later.

In view of the bearing upon the possibility of the occurrence of spontaneous labors in the future, it was attempted to determine in each case whether any enlargement of the pelvis had followed the operation. Careful pelvimetry at the time of discharge failed to reveal any change except in Case II, in which the distance between the tubera ischii of a funnel-shaped pelvis had become increased from 7 to 8 cm.

In addition to the elevated temperature and the general discomfort which characterized the first days of the puerperium, several patients suffered from other complications. Thus there was more or less edema of the vulva on the side of the operation in all cases, while in three it was so pronounced as to cause discomfort. In Cases I and IV, a hematoma, the size of a hen's egg developed in labium majus, but did no particular harm, although in one instance it led to an induration which had not disappeared at the time of discharge. In Case VII, three days after getting up, a slight phlebitis developed in the left leg, but did not materially interfere with convalescence, as the patient was discharged on the thirty-seventh day with satisfactory locomotion. In another patient, Case X, the rise of temperature to 101.6 was probably due to a stitch infection at the upper pubiotomy wound, which healed by granulation. As has already been stated, there was no injury to the bladder, and prolonged catheterization was necessary in but three cases.

At a first glance it might seem that the loss of three children (Cases V, IX and X) indicates that the fetal mortality was excessive, but when the histories are considered in detail it appears questionable whether any part of it can be fairly attributed to the operation. Thus, in Case V, a large child, 57 cm. long and weighing 4050 grams, was born asphyxiated after an easy and rapid breech extraction. Dr. Goldsborough, who performed the operation, is inclined to attribute its death partly to the fact that the patient took the anesthesia very badly and

partly that stress of circumstances made it necessary to intrust the attempts at resuscitation to a student instead of one of the regular assistants. In Case IX, the child was readily delivered after manual dilatation of the cervix in a prolonged dry labor, interference being indicated by beginning fever on the part of the mother. The head was markedly moulded but presented no signs of injury, and had pubiotomy not been performed, it would have been permissible to attribute the death to prolonged pressure upon the head. Likewise in Case X, the fatal issue was probably due to the prolonged labor, which lasted sixty-one hours with a second stage of ten hours. In this instance delivery was readily effected and the head presented no signs of injury.

Three of the patients have become pregnant since the operation, and one (Case IV) was delivered spontaneously at her own home of a seven-pound child, with a biparietal diameter of 8.5 cm. As the conjugata versa measured 7 cm., it is doubtful whether the favorable outcome was due to a readily malleable head or to some permanent enlargement of the pelvis.

Another patient (Case II) has become pregnant twice. The first pregnancy ended July, 1907, in spontaneous premature labor at the seventh month. The second is still in progress and two months from term; while the third patient (Case VII) is at present three months pregnant.

Technic.—Thus far four methods have been described for performing the operation, namely, the open method of Gigli and Van de Velde, the partly subcutaneous method of Döderlein, the subcutaneous method of Bumm and the subcutaneous symphyseotomy described by Zweifel.

The open method, in which the anterior surface of the bone is exposed by an oblique or vertical incision, appears to present but a single advantage over symphyseotomy, in that by making the bone section somewhat eccentrically, the attachments of the bladder and urethra are less exposed to the possibility of injury. In a series of seventy-seven open pubiotomies collected by Döderlein in 1907, the maternal mortality was 10.4 per cent., which is quite as high as that following symphyseotomy and in marked contrast with the low mortality of subcutaneous pubiotomy. Accordingly, this method of operating has been abandoned in favor of the several subcutaneous varieties over which it possesses the single advantage of affording direct access to the bleeding vessels in the rare cases of excessive hemorrhage.

In Döderlein's method, before passing the curved needle beneath the bone and through the labium majus, the soft parts are separated from the posterior surface of the pubic bone by a finger introduced through a small incision parallel to the upper margin of the pubic arch and median to the pubic spine. In this way the bladder is protected from all injury during the application of the saw, while the small upper incision scarcely takes away from its subcutaneous character. I have employed this method in all but my first case, and have been so well pleased with it that I have not felt tempted to experiment with the purely subcutaneous technic.

In the latter operation, which was employed almost simultaneously in the clinics of Bumm and Leopold and described in the articles of Stoeckel and Kannegiesser, no skin incision is made, but a large sharp-pointed needle is introduced through the outer portion of the labium majus and, under the guidance of a finger in the vagina, is passed along the posterior surface of the pubic bone until its upper margin is reached, when by simply depressing the handle its point is made to emerge just median to the pubic spine. The Gigli saw is placed in position by withdrawing the needle, after which the bone is severed entirely subcutaneously.

It is apparent that this method is extremely simple and reduces the possibility of infection to a minimum. At the same time, it is always associated with some danger of perforating the bladder by the sharp point of the needle, which cannot be entirely avoided by any of the devices which will be considered in the section upon the complications of the operation. For this reason, I have continued to employ Döderlein's technic, and the majority of speakers at the German Gynecological Congress in 1907 also advocated its use upon the same grounds.

Zweifel, in 1907, reported twelve cases in which he performed subcutaneous symphyseotomy by cutting through the cartilage with a Gigli saw, which had been placed in position by means of a Döderlein needle introduced through a small vertical incision in the mid-line of the abdomen just above the symphysis. He obtained excellent results in all of his cases, and contends that the operation is superior to pubiotomy in that it facilitates fibrous union between the cut ends of the cartilage and thereby increases the probability of a permanent enlargement of the pelvis and the occurrence of spontaneous labor in future pregnancies.

This operation is undoubtedly greatly superior to the typical

open symphyseotomy, as is readily appreciated upon comparing its results with those described by Thies following fifty-three symphyseotomies performed in the same clinic, with a considerable maternal mortality, prolonged convalescence and frequently impaired locomotion. At the same time it is doubtful whether it presents any advantages over pubiotomy by Döderlein's method, as it would seem more likely to be complicated by injuries to the bladder and urethra. Judgment, however, should be deferred until a greater number of cases become available for comparison.

Whatever the technic employed, most of the German authorities, particularly Zweifel, Döderlein and Bumm, strongly advise against immediate delivery of the child on account of the supposed increase in the danger of deep vaginal and perineal tears. They advocate placing the patient in bed as soon as the bone has been severed, after closing the upper wound with sutures if Döderlein's method has been employed, and allowing the labor to proceed spontaneously, and interfere only upon the appearance of signs of danger to the mother or child.

On the other hand, all of my patients were delivered immediately with very satisfactory results, and I am inclined to attribute the relative infrequency of deep vaginal and perineal tears to the fact that the vaginal outlet was widely dilated manually before beginning the operation, as will be described more fully in the following section. It must be admitted that prompt delivery is the ideal procedure, provided it can be safely effected. In this event the patient can be subjected to the test of labor and pubiotomy performed only when nature has shown herself unable to overcome the resistance after some hours of strong second-stage pains. Moreover, if the operation is undertaken sufficiently early to make it justifiable to wait for spontaneous delivery, it is apparent that one will be in danger of cutting through the pubic bone in cases which would have terminated spontaneously had the operation been deferred until urgently demanded. For this reason I am opposed to the frequent employment of the so-called prophylactic pubiotomy, although I am prepared to admit that it may occasionally be indicated in cases of prolonged dry labor, as in Cases VII and IX, in which complete dilatation of the cervix fails to occur for the reason that it is not exposed to the pressure of the presenting part, which still remains arrested at the superior strait.

One of the great advantages of subcutaneous pubiotomy over

the open method of symphyseotomy, lies in the difference in the extent of gaping which occurs between the ends of the bone following its section. In the former the primary separation rarely exceeds 1 or 2 cm., while in the latter the cut ends immediately gape so widely as to expose the sacro-iliac joints to danger of rupture unless the tendency to separation is counteracted by having the legs of the patient properly held by assistants. This is due to the fact that in pubiotomy the ends of the bone are held together by the overlying tissues and by the attachments of the larger muscles of the thigh. Consequently, greater gaping does not occur until the head presses into the pelvis, when the ends of the bone separate from 3 to 5 or 6 cm., corresponding to the degree of disproportion. According to Sellheim, the enlargement of the pelvis is identical in both operations, but it is necessary to employ three times as much force to bring about the same degree of separation in pubiotomy as in symphyseotomy. For this reason, the extent of gaping is proportionate to the resistance to be overcome, and consequently injuries to the sacro-iliac joints, with subsequent impaired locomotion, occur far less frequently than after symphyseotomy.

The care of the patient during the puerperium, and more particularly the decision as to whether it is necessary to attempt to immobilize the pelvis, will depend almost entirely upon the manner in which the healing of the bone wound is effected. Gigli, in his first communication upon the subject, believed that firm bony union occurred, and one of the arguments which he advanced in favor of pubiotomy was that healing would take place more readily and with less danger of infection in the bone than in a cartilage wound.

More extended experience, however, has shown that his belief is erroneous and that in many cases, at least, true bony union does not occur, the ends of the bone becoming united by dense fibrous tissue, which may be more or less infiltrated by calcareous material. Thus, in a considerable proportion of cases, it is found on examination at the time of discharge that a considerable degree of motility exists at the site of section, as can be demonstrated by passive movement of the thighs or by having the patient take a few steps during vaginal examination. This may be the case in spite of the development of a layer of callus of varying thickness upon the anterior surface of the wound, and occasionally even though x-ray photographs appear to indicate that firm bony union had occurred. Moreover, in several in-

stances in which the operation has been performed a second time upon the same patient, the ends of the bone were found to be some distance apart and united by fibrous tissue. Similar conditions were likewise noted by Oberndorfer, Cristofolletti and others at autopsies upon women dying a year or more after the operation. As it has been shown that such a lack of ossification has no effect upon locomotion, it is apparent that the abnormalities in that regard, which sometimes follow symphyseotomy, could not be attributed to defective union, but were probably due to injuries sustained by the sacro-iliac joints.

As soon as it became recognized that lack of bony union did not interfere with locomotion or with the comfort of the patient, fibrous union came to be regarded as advantageous, rather than otherwise; and accordingly, many patients have been so treated as to encourage its formation in the hope that the fibrous tissue may become so softened and lengthened in subsequent pregnancies as to bring about considerable enlargement of the pelvis and thereby permit spontaneous labor. For this reason, most German authorities do not attempt to immobilize the pelvis, but encourage the patient to move about in bed as soon as she feels so inclined. Consequently, it is not necessary to employ a specially-constructed bed or hammock or to place the patient between sand-bags or to adopt any other expedient tending to hold the ends of the bone in apposition.

Thus far I have employed a twelve-inch adhesive-plaster bandage in all of my cases; but in view of the fact that others obtain equally favorable results without it, I shall discontinue its use in the future. As has already been indicated, we have found that the use of the Bradford frame greatly facilitates caring for the patient. It is not employed with any idea of immobilizing the pelvis, but simply to afford a convenient method of handling her.

From time to time modifications in the operative technic have been suggested in the hope that permanent enlargement of the pelvis might be secured and thus avoid the necessity for repeated pubiotomy in future pregnancies. For example, Crede has proposed an osteoplastic operation and Truzzi the interposition of a piece of calcined or decalcified bone, with the idea that after bony union had occurred the pelvis might remain permanently larger. Schickele, on the other hand, devised a step-like incision of the bone, which he thought would insure the formation of extensive fibrous union. It is as yet too early

to judge of the value of such suggestions, but it nevertheless appears safe so predict that no modifications will receive general acceptance which require extensive manipulation and the abandoning of the subcutaneous principle of operating.

Complications Occurring During the Operation or Puerperium. Hemorrhage.—When one considers that the crus of the clitoris is either severed when the pubic bone is divided, or is torn through when the ends of the bone gape during the extraction of the child, a certain amount of hemorrhage must inevitably accompany every pubiotomy. Usually it is slight in amount and ceases spontaneously, as the lacerated vessels tend to bleed but little, while in other cases it promptly yields to compression. Thus, in only one of my series was it sufficiently abundant to cause alarm, and that was in the case associated with a deep communicating vaginal tear. Tandler suggested that the crus clitoridis be isolated and divided between sutures before severing the bone, but experience has shown that it is unnecessary, especially as it necessitates a large open wound; moreover, in the rare instances in which profuse hemorrhage follows this injury, it can readily be controlled by applying a few deep stitches through the tissues adjacent to the pubic arch.

In rare instances, however, profuse and even alarming hemorrhage may occur. In such cases it is usually due to injuries to the vesical plexus or to cutting through an aberrant branch of the internal pudic artery. If due to the former, it can usually be checked by compression applied both externally and through the vagina; but if due to the latter, the entire wound must be laid widely open and the cut ends of the artery seized and ligated. As far as I am aware, Rosthorn has reported the only case of fatal hemorrhage following the operation and which could not be checked by any resource at his command. I am inclined to believe that most of the serious hemorrhages which occur during the operation are due to deep communicating vaginal tears rather than to either of the factors just mentioned, and will therefore occur less and less frequently as we learn to prevent the occurrence of such injuries.

Injuries to the Soft Parts.—The most serious of these are deep vaginal tears which communicate with the pubiotomy wound, thus doing away with every advantage arising from the subcutaneous technic. When the mutual relations between the vaginal walls and the pubic arch are considered, it is apparent that after the latter is severed only a thin layer of tissue separates the

vagina from the pubiotomy wound, and if the ends of the bone are widely separated, before the vagina has become sufficiently dilated to accommodate itself to the stretching, deep communicating tears must occur through its wall. For this reason, most authorities recommend that delivery be allowed to occur spontaneously, except in the presence of pressing indications, as forcible extraction of the child through a rigid, undilated vagina will almost certainly lead to the production of a tear. Likewise, it is usually advised that the operation be practically restricted to multiparæ, and that the tension be relieved by deep lateral perineal incisions when immediate delivery becomes necessary.

I admit that these precautions were formerly justified, but at the same time I contend that they may be omitted and prompt delivery by forceps or extraction rendered as safe as spontaneous delivery, provided the perineum and vagina have been thoroughly dilated preliminary to the pubiotomy. For this purpose, the gloved hand, folded in the shape of a cone and well lubricated, is slowly passed into the vagina, which is gradually dilated until it will readily admit the closed fist, and after that still further dilated by the fingers of both hands placed back to back. By this means a degree of dilatation is obtained in a few minutes which is nearly comparable to that effected by the head of the child, and which secures such relaxation of the vaginal wall as enables it to accommodate itself without rupture to the rapid separation of the cut ends of the bone.

That this is the case is shown by the fact that a vaginal tear occurred in only one of my thirteen cases, notwithstanding the fact that nine of the women were pregnant for the first time. The same procedure also minimizes the frequency of perineal laceration, which occurred in only three of our cases. In two instances the tear was of the first degree, while in the other, which occurred in a multipara following the breech extraction of a large child, it extended down to, but not through the sphincter. These results, which are eminently satisfactory, could hardly have been better in normal spontaneous labor or in ordinary low forceps operations, and clearly demonstrate the prophylactic value of preliminary manual dilatation of the vaginal outlet, as well as its superiority over deep perineal incisions.

Injury to the Bladder.—Such lesions usually occur in one of two ways; either by the inability of the adherent bladder to follow the gaping pubic bone or by its perforation with the needle.

Both are much less liable to occur when Döderlein's technic is employed, as the preliminary separation of the tissues from the posterior surface of the bone markedly decreases the possibility of the first-mentioned accident, while the second can only occur when the needle is introduced subcutaneously. This is clearly shown by the fact that injuries to the bladder were not observed in my series nor in the twenty-five cases operated upon by Döderlein, while they were quite frequently noted in Bumm's series of cases. Naturally, they will occur less frequently when Stoeckel's suggestion is followed of determining the location of the bladder before the operation by the use of the catheter and making the section on the side of the pelvis not occupied by it; but punctured wounds cannot be entirely avoided as long as the needle is introduced entirely subcutaneously.

In view of the possibility of this accident, the patient should be catheterized after the delivery of the child, when the presence of blood-stained urine should lead to the diagnosis of a bladder lesion. If it be merely a puncture, spontaneous healing will usually follow if a retention catheter be used; but when the injury is more extensive the bladder should be drawn up into the wound and the injury be repaired by suture.

Hematoma.—In a considerable proportion of the cases reported in the literature, convalescence was complicated by the development of a hematoma in the labium majus on the side of the operation. Unless the hemostasis has been absolute, hematomata will certainly occur and give rise not only to a certain amount of discomfort, but also predispose to infection, occasionally suppurate and materially increase the probability of a phlebitis. Unfortunately, they represent one of the unavoidable complications of the operation and cannot always be avoided. They were noted in two of my cases, and in one instance underwent suppuration.

Phlebitis.—Thrombosis of the vessels of the thigh on the side of the operation is likewise a not infrequent complication, and was noted in one of my cases. It is usually due to infection, associated with deep communicating vaginal tears, labial hematomata or lesions of the bladder. That it is probably often due to unrecognized lesions of the bladder is shown by the fact that it ceased to occur, in Kroemer's experience, after the introduction of the routine employment of the retention catheter during the first part of the puerperium.

Hernia.—In rare instances, as reported by Franz, Hartmann,

and Mann, hernias may later protrude through the pubiotomy wound. This was usually noted in cases which had been complicated by suppurative processes and particularly when an inguinal hernia already existed. According to Mann, it may be due to one of several factors: either to a diastasis through the lower part of the rectus muscle, to the absence of union between the ends of the pubic bone or to stretching of the tissues uniting them.

Indications for Operation.—As pubiotomy is undertaken principally in the interests of the child, its justifiability will depend entirely upon the maternal mortality and the rapidity of recovery following it. Consequently its results will have to be compared with those following the induction of premature labor, symphyseotomy and Cesarean section for the enlarged relative indication.

At the 1907 meeting of the German Gynecological Congress, Döderlein presented an analysis of 170 pubiotomies reported by thirty-five writers and performed either by his own technic or that of Bumm, with a maternal mortality of 4.1 per cent. In the discussion following his paper, nineteen speakers gave their experience, aggregating 319 cases with six deaths, a mortality of 1.88 per cent. This difference clearly demonstrates the improvement in technic resulting from increased personal experience, as the smallest number of operations reported by any one speaker was five, while the average was seventeen cases, and affords a marked contrast to the statistics of Döderlein, in which are included many isolated cases by individual operators. Moreover, Gigli, in a personal communication to Montgomery, stated that he had collected reports from nearly 300 operations with a mortality of between 1 and 2 per cent., which practically became reduced to zero upon deducting the cases which were already infected when operated upon. Bumm, in the *Zentralblatt für Gynäkologie* for May 9, 1908, stated that fifty-two operations had been performed in his clinic, with a single death from embolic pneumonia, a mortality of 1.92 per cent.

When it is considered that a considerable proportion of the cases reported in the literature manifested signs of infection at the time of operation, which undoubtedly increased the number of deaths from that cause, a mortality of 2 per cent. should be considered as highly satisfactory, and should justify the prediction that in the future it will become materially diminished in the hands of experienced operators in judiciously selected cases.

It must, however, be admitted that even so small a mortality

as 2 per cent. compares unfavorably with that following the induction of premature labor, which in competent hands should not exceed a fraction of 1 per cent. On the other hand, it should be remembered that with pubiotomy 95 per cent. of the children will be born alive at full term with excellent prospects of further development, as compared with 75 to 80 per cent. of poorly developed children following the induction of premature labor, from which must be further deducted the large number which will succumb in the succeeding months.

Accordingly, I feel very strongly that pubiotomy will eventually practically supersede the employment of the latter operation in the treatment of moderate degrees of pelvic contraction. Particularly as the figures just given do not adequately indicate its full advantages, for the reason that the knowledge that one possesses in pubiotomy, a satisfactory method of overcoming the disproportion between the size of the head and the pelvis will lead to the more extensive adoption of expectant treatment in such cases, with the result that 75 or 80 per cent. of the labors will end spontaneously at full term, while pubiotomy would probably not be required in more than one-fourth of the remaining 20 to 25 per cent. In this event, approximately only 5 or 6 per cent. of the women presenting moderate degrees of pelvic contraction would be exposed to the comparatively small dangers of pubiotomy; while, on the other hand, if the induction of premature labor were the recognized method of treatment, it would necessarily be employed in a much larger proportion of cases, say 25 to 30 per cent. Consequently, the much more frequent employment of the latter operation, even with its comparatively low mortality would probably lead to the death of as many women in a given series of cases as the less frequent employment of the more dangerous pubiotomy. Moreover, similar considerations applied to the child would still further accentuate the advantages of pubiotomy and place the results following the induction of labor in an even less favorable light.

Thus, assuming that the figures given above are approximately correct and that two series of 1000 cases of moderately contracted pelves were treated by pubiotomy and the induction of labor, respectively, it would appear that the former operation would be required in fifty and the latter in 250 women; and that if the maternal mortality were, respectively, 2 and $\frac{1}{3}$ per cent., the number of deaths would be identical in both series. On the other hand, admitting that the fetal mortality were 10 and 25 per cent.,

respectively, five children would be lost in the former and sixty-two in the latter series. Or, to put the matter more forcibly, a greater number of children would have been saved had craniotomy been performed in all cases in which pubiotomy was indicated.

Naturally, it might be suggested by the advocates of the induction of premature labor that such calculations are not convincing. That they are not purely speculative, however, is demonstrated by the figures recently adduced by Bürger, which are based upon an analysis of 49,000 labors occurring in Schauta's clinic in Vienna. In this series there were 4240 contracted pelves with a fetal mortality of only 2.2 per cent. in the cases in which spontaneous labor occurred; whereas it rose 4.3 per cent. in the cases treated expectantly, including all deaths following craniotomy, pubiotomy and Cesarean section. Results which cannot be approximated by the most enthusiastic advocate of the induction of labor.

It seems almost unnecessary to compare the results following pubiotomy and symphyseotomy. It is generally admitted that the fetal mortality is identical in both operations, while the maternal mortality is 2 per cent. in the former as compared with 8 to 12 per cent. in the latter. Moreover, the convalescence is far less satisfactory and much more prolonged after symphyseotomy, as is conclusively shown by Thies' recent report upon the fifty-three operations performed in Zweifel's clinic.

Having shown that pubiotomy is superior to the induction of labor and symphyseotomy, it remains to consider to what extent it enters into competition with Cesarean section. In the first place, it must be stated that the former operation is not indicated when the conjugata vera measures less than 7 cm. Consequently there can be no competition except in pelves above that limit; namely, in the so-called "border-line" cases, in which it is generally impossible to predict the outcome of labor in any given case. Moreover, it must be admitted that if the decision were based entirely upon the general mortality of the two operations, it would have to be given in favor of pubiotomy, as an analysis of the reports of the best operators shows that the average mortality in Cesarean section is in the neighborhood of 5 per cent.

The researches of Reynolds, however, indicate that this figure does not altogether represent the true state of affairs, but that, admitting the competence of the operator and the excellence of his technic, the results will vary greatly according to

the period of labor at which the operation is performed. Thus, in an analysis of 289 cases, he found that the mortality was 1.2, 3.8 or 12 per cent., respectively, according as the operation was performed during the last days of pregnancy, or early or late in labor. As his results are in accordance with my own experience, I feel justified in holding that the results of Cesarean section performed just before or at the very onset of labor are superior to those of pubiotomy, both as regards the actual mortality and ease of convalescence of the mother, not to mention the fact that all of the children are saved, instead of only 95 per cent. as in pubiotomy. On the other hand, Cesarean section performed early in labor has a somewhat greater mortality than pubiotomy; while if not resorted to until the second stage is well advanced there can be no comparison between the two operations, as the former has a mortality of 10 or 12 per cent. and the latter of only 2 per cent.

Accordingly, if it were possible to predict in a given case that engagement would not occur, the best interests of both the mother and child would be served by performing Cesarean section at an appointed time a few days before the expected date of confinement; as by so doing the child would certainly be saved, with a minimal risk and an almost ideal convalescence for the mother. Unfortunately, in the class of pelves under consideration, such a prediction is never possible in women pregnant for the first time and only exceptionally in multiparæ. Therefore, in primiparæ Cesarean section would not be indicated at the time of election, unless one were willing to assume the responsibility of operating unnecessarily upon a considerable number of women when one knew by experience that a large proportion of them would be delivered spontaneously if subjected to the test of labor. For this reason, early elective Cesarean section would be justified only in multiparæ in whom the history of previous labors had clearly indicated that nature was habitually unable to overcome the disproportion between the size of the head and the pelvis.

On the other hand, if Cesarean section is not done at the very onset of labor, I consider that the best interests of the patient will be served if she be treated expectantly, allowed to go into the second stage of labor, and then subjected to pubiotomy, if engagement does not occur after several hours of strong pains, or in the presence of certain conditions which indicate the necessity for prompt delivery. Under such circumstances, Cesarean

section is a dangerous operation and, while it may save a few more children, exposes the mother to a risk five or six times greater than if pubiotomy had been employed and therefore does not seem to me to be justifiable.

To my mind, the great advantage of pubiotomy in the treatment of border-line cases of pelvic contraction consists in the fact that it affords the possibility of subjecting the patient to the test of labor in suitable cases and then of interfering for the sake of the child without subjecting the mother to too great danger. In other words, it enters into competition with high forceps, prophylactic version and craniotomy rather than with Cesarean section.

I have repeatedly stated that its lowest limit should be placed at a conjugata vera of 7 cm., but unfortunately its upper limit cannot be so readily given; and while, generally speaking, the operation will rarely be indicated when the conjugata vera exceeds 8.5 cm., it may occasionally become necessary in larger pelves. Indeed, it may be said that its upper limit cannot be defined and that it is justified in any case, no matter what the pelvic measurements may be, in which a prolonged test of labor demonstrates that the uterine contractions are unable to overcome the disproportion. For this reason, it may be indicated in practically normal pelves when the child is unusually large, as well as in certain cases of brow and mento-posterior presentations in which version is contraindicated.

In addition to the well known varieties of pelvic deformity, it may also find a considerable field of usefulness in certain cases of outlet contraction or funnel pelvis, as has been shown by the experience of Van de Velde and myself. In such cases the indication is afforded not merely by a certain degree of shortening in the distance between the tubera ischii, but only after a most careful study of all the measurements concerned, and particularly of the anterior and posterior sagittal diameters of the outlet to which I have directed attention in the appropriate chapter of my text-book.

I desire to emphasize the fact that if good results are to be obtained, pubiotomy should be regarded as a primary operation, and should not be resorted to after the failure of high forceps or version. If delivery be urgently demanded in such cases, I feel that it is better to perform craniotomy than to subject the mother to any risk for the sake of a child whose life has already been compromised. Moreover, I feel that it should not be em-

ployed in cases of infection, as a large part of the fatal results recorded in the literature have occurred in that class of cases. At the same time, it may be permissible when the temperature is slightly elevated but definite signs of infection are not present, as in Case IX, but even under such circumstances I believe that the prognosis is markedly impaired.

Finally, I wish to go on record as stating that I do not consider that pubiotomy is an operation for the general practitioner; for, although, it is usually readily performed, it may at any time lead to serious complications which will tax to the utmost the resources of even an experienced operator.

Case Histories.—CASE I.—McCoy, Obst. No. 2484. Colored v-para, age twenty-six years. Generally contracted rachitic pelvis: 23.5, 24.75, 30, 19.5 and 10.5 cm. Pubic arch wide, transverse of outlet 10.5 cm. Has had three spontaneous labors at term and two macerated children at about the seventh month.

The child lay in L. O. T., and was apparently of large size. The first stage of labor lasted nineteen hours; and after five hours of strong second-stage pains, only a small segment of the head had become engaged. As there was apparently no probability of the occurrence of spontaneous labor, pubiotomy was determined upon.

Operation: February 13, 1906. Left-sided pubiotomy by the open method; forceps applied to the sides of the head. On making traction, the ends of the bone gaped for 5 cm. and the child was readily delivered. There was considerable hemorrhage from the pubic wound, which was controlled by compression. No injury to the perineum, vagina or bladder. The cutaneous wound was closed by formalin catgut sutures, several of which included the periosteum. Drainage of labial wound. The child was born in good condition, weighed 4055 grams and presented the following head measurements, 15, 12.5, 10, 9.5 and 8.5 cm.

The puerperium was uneventful, the highest temperature being 100.7 degrees on the day of delivery. Catheterization was not necessary. There was considerable swelling of the left labium majus due to hematoma formation. The patient was out of bed on the twenty-ninth day, walked on the thirty-first and was discharged in good condition on the thirty-sixth day. At that time the wound over the pubis was found to be healed by first intention, though the left labium majus was still considerably indurated. The outer surface of the pubis presented a slight depression at the site of the section, while its inner surface was smooth and no trace of the section could be detected. There was a painful thickening in front of each sacro-iliac joint, which was more marked on the right side. This projected $1\frac{1}{2}$ cm. beyond the surface so that the promontory of the sacrum seemed to lie in a depression. Locomotion was very satisfactory

although there was definite motility at the pubic wound. Vaginal examination showed: outlet excellent; cervix slight stellate tear; uterus forward, movable and well involuted; appendages negative.

The patient was seen again one month after the operation, when all trace of the swelling about the sacro-iliac joints had disappeared except for a slight non-sensitive ridge on the left side.

CASE II.—Hupka, Obst. No. 2553. White i-gravida, twenty years old. Generally contracted, funnel-shaped pelvis: 23, 26, 30, 18.25, and 10 cm. Pubic arch very narrow, transverse of outlet 7 cm.

I saw patient in consultation after she had been in labor for fourteen hours and found the cervix fully dilated and a fair-sized child presenting at the superior strait in L. S. A. frank breech. In view of the combination of breech presentation and funnel pelvis, it was thought best to perform pubiotomy. The patient was therefore sent to the hospital and the operation begun one and one-half hours later. During this interval there had been no descent in spite of strong pains.

Operation, April 13, 1906: preliminary manual dilatation of vaginal outlet, pubiotomy by Döderlein's method on the left side. The anterior foot was brought down and extraction readily effected, during which the cut ends of the bone gaped 4 cm. There was almost no hemorrhage. The perineum and vagina were not torn. After expressing the placenta, the upper wound was sutured and an adhesive plaster bandage applied about the pelvis. The child was born in good condition, weighed 2660 grams and presented the following head measurements: 12.5, 11.5, 10, 9.5 and 7 cm.

The puerperium was uneventful except for slight abdominal distention on the fourth day. Highest temperature 100.3 degrees. The patient's only complaint was that she was compelled to lie in one position. She sat up on the twenty-fourth day and was discharged on the twenty-second day, when the following conditions were noted: outlet excellent; cervix very slight transverse tear; uterus forward, movable and well involuted; appendages normal; locomotion excellent. Large callus on anterior but no trace of the wound palpable on posterior surface of pubis; sacro-iliac joints clear. The pelvic measurements were unchanged except that the transverse of the outlet had been increased 1 cm.

Patient returned to the hospital January, 1907, two months pregnant, and stated that she had had no trouble since her discharge. Examination showed slight motility at the site of the operation. This pregnancy ended spontaneously at the seventh month. She reappeared May 10, 1908, and stated that she was again between seven and eight months pregnant, felt perfectly well and arranged to return to the hospital for delivery.

CASE III.—Adams, Obst. No. 2501. Colored i-gravida, age 16 years. Generally contracted rhachitic pelvis: 23.25, 22.75, 28, 16.5 and 8.75 cm. Pubic arch wide, transverse of outlet 10 cm.

The child lay in L. O. T. Total duration of labor—thirty-two and a half hours. As there was no advance after three hours of strong second-stage pains and the head still at the superior strait in the posterior parietal position, pubiotomy was determined upon.

Operation, July 2, 1906: Typical left-sided Döderlein pubiotomy, preceded by manual dilatation of the vaginal outlet. Easy delivery with forceps. No note as to extent of gaping. Slight hemorrhage, no vaginal and a very slight perineal tear, which required one suture for its repair. The child was born alive, weighed 2415 grams and presented the following head measurements: 13.25, 11.5, 8.5, 8.25 and 7.75 cm. The head was markedly moulded, presented an extensive caput and a deep depression where the posterior parietal bone had been pressed upon the promontory of the sacrum.

The puerperium was uneventful, the highest temperature being 100.5 degrees on the seventh day. Catheterization not necessary. She was kept in bed for four weeks and was discharged on the thirty-seventh day. At that time the outlet was excellent; cervix not torn; uterus retroflexed and adherent, appendages not felt; locomotion excellent; no sign of callus upon either anterior or posterior surface of pubic bone or at sacro-iliac joints.

The patient returned for inspection, December 19, 1907, and stated that she had since been operated upon for the displaced uterus. Examination showed a slight callus on the anterior surface of the pubic bone, but no trace of the wound posteriorly. Sacro-iliac joints normal. No subjective symptoms except for slight cystitis following suspension of uterus.

CASE IV.—Stewart, Obst. No. 2763. Colored i-gravida, nineteen years old. Flat rhachitic pelvis with double promontory: 25.75, 26.25, 31.25, 17.5 and 8.5 cm. Pubic arch wide, transverse of outlet 10.5 cm. Child in R. O. T.

The patient was sent into the hospital from the outpatient service after having been in labor for fifteen hours, with the cervix 4 cm. in diameter. Eight hours later the membranes ruptured and examination showed the cervix fully dilated, but the head not engaged. As there was no advance after three hours of good second-stage pains, pubiotomy was determined upon.

Operation, October 25, 1906. Typical left-sided Döderlein pubiotomy by Dr. Goldsborough. Immediately after severing the pubic bone the head descended to the level of the ischial spines; easy mid-forceps delivery, during which the ends of the bone gaped 3 to .4 cm. There was but slight hemorrhage and no perineal or vaginal tear. The child was born alive, in good

condition, weighed 3230 grams and presented the following measurements: 13.15, 11.25, 9.25, 8.5 and 7.5 cm.

The puerperium was somewhat disturbed. There was marked abdominal distention on the third day, when the pulse reached 140 and the temperature 102 degrees. The patient was quite sick until the bowels moved, after which her condition became satisfactory. There was some edema and a small hematoma of the left labium majus. At no time was catheterization necessary. She was out of bed on the eighteenth day and was discharged on the twenty-third day.

On discharge the outlet was excellent; cervix, slight bilateral tear; uterus retroflexed, movable and well involuted; appendages negative. There was considerable callus on the anterior surface of the pubic bone, but no trace of it posteriorly. No motility on passive movement of thighs. Walks without pain.

January 13, 1908, the patient was delivered spontaneously at her own home of a child weighing seven pound, which presented the following measurements, 13.5, 11.25, 9.25, 8.5 and 7.5 cm. Puerperium normal and locomotion perfectly satisfactory.

CASE V.—Anderson, Obst. No. 2728. Colored i-para, age twenty-four years. Generally contracted rhachitic pelvis, 22 22.75, 25, 15 and 9.75 cm. Pubic arch wide, transverse of outlet 10½ cm. Marked false promontory of sacrum. Previous pregnancy ended at seven months.

Patient did not learn to walk until she was seven years old. Child presented in L. S. A. frank breech. Slight contractions for three days, definite pains, however, began 5 P. M., November 26, 1906, and the membranes ruptured spontaneously at 9 P. M., when the cervix was almost fully dilated. As there was no advance three and a half hours later, pubiotomy was determined upon.

Operation, November 27, 1906, Dr. Goldsborough: After manual dilatation of the vaginal outlet, left-sided Döderlein pubiotomy. Extraction easy and rapid, but the amount of gaping between the ends of the bones was not noted. As there was considerable hemorrhage, the placenta was expressed almost immediately after the delivery of the child. This, however, did not completely check the bleeding, and on examination a deep tear was found in the left and anterior portion of the vagina, extending from the vaginal outlet almost to the cervix. A finger introduced into the tear came in contact with the cut ends of the bone, which were about 2 cm. apart. This wound, as well as a second-degree perineal tear, was closed with interrupted catgut sutures. As there was still considerable hemorrhage, an iodoform pack was introduced into the vagina and a small drain brought out through the labial incision. The patient presented marked signs of collapse during and just after the operation, but revived after the injection of saline solution.

The child gasped a number of times, but could not be resusci-

tated. It was 57 cm. long, weighed 4050 grams and presented the following head measurements: 13.25, 12.75, 10.5, 10.25 and 9 cm. No definite cause for its death could be ascertained. Dr. Goldsborough did not consider it due to the operation, as the extraction had been easy and only required two minutes, but was inclined to attribute it partly to the fact that the patient took the anesthesia very badly and partly because the resuscitation was intrusted to a student, as the serious condition of the patient claimed the services of all the assistants.

The puerperium was distinctly abnormal and the patient was seriously ill for several days, the temperature reaching 102.2 on the seventh day and the pulse varying between 100 to 120. Catheterization was necessary for several days, and there was considerable edema of the left side of the vulva, but no definite hematoma formation. This did not interfere with a satisfactory recovery, as the patient was out of bed on the twentieth and was discharged on the twenty-eighth day, when the following conditions were noted: outlet excellent; cervix not torn; a linear scar on left side of vagina; uterus forward, moveable, well involuted, appendages not felt. There was a slight callus on the outer surface, but no trace of the bone wound on the inner surface of the pubis. Sacro-iliac joints normal, no motility on passive movement of thighs.

The patient was seen again six months later, when she reported that she was in excellent condition and had no trouble in walking or working.

CASE VI.—Boston, Obst. No. 2739. Colored i-gravida, age seventeen years. Generally contracted rhachitic, assimilation pelvis with six sacral vertebræ. Measurements: 21, 23, 29, 16.5 and 9.5 cm. Pubic arch narrow. The child lay in L. O. A. Membranes ruptured twenty-four hours after the onset of labor, when examination showed that the cervix was fully dilated. Two hours later the head was still at the superior strait, with marked over-lapping of the bones and a large caput which reached to the ischial spines.

Operation, December 4, 1906: Preliminary manual dilatation of vaginal outlet. Left-sided Döderlein pubiotomy. High forceps were applied to the sides of the head, which was readily extracted. The bone incision gaped 4 cm. Slight hemorrhage, no vaginal or perineal tear. The child was born in good condition, weighed 3230 grams and presented the following measurements: 14.5, 11.5, 9.5, 9.5 and 8.5 cm. The left parietal bone was markedly distorted and presented a deep depression where it had pressed upon the promontory of the sacrum.

The puerperium was febrile, though the patient was at no time seriously sick. The highest temperature was 101.5 degrees, except for a single rise to 102.3 on the seventh day. There was some edema of the vulva on the third day. No trouble with the bladder; catheterization not necessary. The patient was out of bed on the seventeenth day and was discharged on the twenty-

eighth day, when the following conditions were noted: outlet excellent; cervix, slight bilateral tear; uterus forward, movable and well involuted, appendages not felt. Slight callus on anterior surface of pubic bone, but no trace of section posteriorly. Sacro-iliac joints normal. Locomotion normal.

The patient reported in April, 1908, that she has been perfectly well since the operation.

CASE VII.—Waters, Obst. No. 2851. Colored i-gravida, sixteen years old. Generally contracted, rhachitic assimilation pelvis, with six sacral vertebræ. Measurements: 23.5, 23.5, 26.5, 14.25 and 8.75 cm. Pubic arch wide, transverse of outlet $10\frac{1}{2}$ cm.

The child lay in L. S. A. and on account of the small size of the pelvis, it had been determined to perform Cesarean section at the onset of labor. This was not done as the membranes ruptured prematurely and within fifteen minutes after the first pain one foot, and a little later both feet appeared at the vulva. When I saw the patient two hours later, the cervical canal was obliterated and the external os two-thirds dilated, with the breech still at the superior strait. In view of the prolapse of the feet, Cesarean section seemed contraindicated and pubiotomy appeared to offer the most conservative method of delivery.

Operation, February 3, 1907: After dilating the vulva manually and completing the dilatation of the cervix, pubiotomy was done on the left side by Döderlein's method, and the child readily extracted, during which the cut ends of the bone gaped for 6 cm. There was but slight hemorrhage and no vaginal or perineal tear. The child was born in excellent condition, weighed 3040 grams and presented the following head measurements: 13, 11, 9.6, 8.75 and 7.5 cm.

The patient was very comfortable during the puerperium, in spite of the fact that a small hematoma developed in the left labium majus and catheterization was necessary for ten days. The highest temperature was 102 on the fourth day. The patient was out of bed on the sixteenth day and developed a slight phlebitis in the left leg four days later, which was not accompanied by a rise in temperature and did not materially prolong her stay in the hospital, as she was discharged on the thirty-seventh day in excellent condition. At that time the following conditions were noted: outlet excellent; cervix, slight bilateral tear; uterus forward, movable and well involuted; appendages normal. No callus on either surface of pubic bone, sacro-iliac joints normal. Definite motility on passive movement of thighs. Seen May, 1908, three months pregnant.

CASE VIII.—Strange, Obst. No. 2964. Colored i-gravida, age eighteen years. Generally contracted rhachitic assimilation pelvis. Measurements: 21.75, 23, 27.75, 16.5 and 9.5 cm. Pubic arch good and transverse of outlet 10 cm.

Child in R. O. P. The first-stage pains were not severe. Membranes ruptured spontaneously at the end of forty hours, when the cervix was found to be fully dilated and

the head resting at the superior strait. As there was no advance after three hours of strong second-stage pains, pubiotomy was determined upon.

Operation, by Dr. Goldsborough, April 15, 1907. Typical left-sided Döderlein pubiotomy, easy high forceps delivery, during which the bone wound gaped 5 to 6 cm. There was very little hemorrhage, no injury to the vagina and only a superficial perineal tear which required two sutures for its repair. The child was born somewhat asphyxiated, but was readily resuscitated. It weighed 2450 grams and presented the following measurements: 13.75, 10.25, 9.5, 8.75 and 7.25 cm.

The puerperium was uneventful, the highest temperature being 100.2. The patient was very comfortable and did not require catheterization. She was out of bed on the eighteenth day, walked on the twenty-third day and was discharged on the thirty-fifth day. Examination at that time showed: outlet excellent; cervix, slight left-sided tear; uterus forward, movable, well involuted; appendages not felt. Slight callus on anterior, but none on posterior surface of pubis. Sacro-iliac joints normal, locomotion excellent, no motility on passive movement of thighs. Patient not seen since.

CASE IX.—Bowie, Obst. No. 3149. Colored i-para, thirty-two years old; spontaneous delivery of small child five years previously. Flat rachitic pelvis; measurements: 25, 26, 30.75, 16 and 10.5 cm. Pubic arch fair, transverse of outlet 9 cm. Large child in R. O. T.

The patient was admitted after having been in labor for twenty-four hours with the membranes ruptured and the external os 3 cm. in diameter with thick margins. Twenty-four hours later the patient showed signs of exhaustion, with a temperature of 100.2 degrees. Examination showed that the cervix was 5 cm. in diameter and the uterus tightly contracted over the child. The head was movable at the superior strait, the posterior parietal bone presenting and the ear lying just in front of the promontory. In view of these conditions, prompt delivery seemed imperative.

Operation, Dr. Storrs, September 10, 1907: After stretching the vaginal outlet and completing the dilatation of the cervix by Harris' method, a left-sided Döderlein pubiotomy was done. The child was delivered after an easy high forceps operation, during which the ends of the bone gaped for 3 cm. There was no vaginal or perineal tear. The child gasped several times, but could not be resuscitated. Unfortunately, its weight was not noted. The head was markedly moulded, but showed no definite depression, death being probably due to the prolonged dry labor.

The puerperium was uneventful, except for marked mental disturbance, the highest temperature being 101.2 degrees on the ninth day. In the absence of the nurse, the patient got out of bed on the fourth day, and after that turned freely in bed. She

was allowed to walk on the twenty-second day and was discharged on the twenty-fifth day. At that time the condition of the soft parts was excellent, Locomotion satisfactory and painless, no callus on either surface of the bone wound, sacro-iliac joints normal, no motility on passive movements of thighs.

CASE X.—Walters. Obst. No. 3070. Colored i-gravida, age seventeen years. Generally contracted, rhachitic, coxalgic pelvis. Considerable scoliosis, with convexity directed to the right; numerous cicatrices over right buttock. Measurements, 19, 19.5, 25.5, 16.5 and 9.75 cm. Pubic arch and transverse of outlet normal. The child lay in L. O. T. The entire labor lasted sixty-one hours, fifty-two of which belonged to the first stage. Owing to the fact that several serious cases were going on simultaneously, both in the in and out-patient services, which kept the entire staff busy, the patient was not seen until she had been in the second stage for nearly six hours; the pains, however, were not severe. At that time examination by the resident obstetrician showed the cervix fully dilated, the head at the superior strait, with the posterior parietal bone presenting. It was not possible to operate upon her for another four hours, but at that time she was in good condition and the child's heart apparently normal.

Operation, October 14, 1907: Typical left-sided Döderlein pubiotomy, easy high forceps, though rotation did not occur until the perineum was well distended. No vaginal or perineal tear, no hemorrhage. No note was made as to extent of separation of the ends of the pubic bone. In spite of the easy delivery, the child was born dead and could not be resuscitated. It weighed 2410 grams and presented the following measurements: 15, 13, 9, 8.5 and 7.5 cm. No cause for death discoverable.

The puerperium was uneventful, the highest temperature being 100.4, except for one occasion on the fifth day, when it reached 101.6 degrees, which was attributed to a stitch abscess in the upper wound. Catheterization was not necessary. The patient moved freely in bed at the end of the first week, out of bed on the twenty-third day and was discharged on the twenty-ninth day. Examination at that time showed the perineum excellent; cervix not torn; uterus forward, movable and well involuted and appendages normal. No callus on either surface of pubic bone, sacro-iliac joints normal. Locomotion excellent, no motility on passive movement of thighs.

The patient was demonstrated three months after the operation when she walked and ran perfectly satisfactory.

CASE XI.—Slatoff, Obst. No. 3175. White i-gravida, age nineteen years. Funnel-shaped pelvis with following measurements: 26.5, 27.2, 31, 19, diagonal conjugate could not be measured. Pubic arch narrow, transverse of outlet 7 cm., anterior sagittal 6 cm., posterior sagittal 7 cm. Child lay in L. O. A.

The entire labor lasted twenty-two and a half hours. Exami-

nation at the end of twenty hours showed the cervix fully dilated, membranes ruptured, head well below the ischial spines. As there was no advance two and a half hours later, pubiotomy was determined upon.

Operation, October 25, 1907. Typical left-sided Döderlein pubiotomy. Forceps readily applied, but strong traction was necessary in order to bring the child to the vulva. After the outlet was well distended, the forceps were removed and the head expressed by Ritgen's maneuver. There was no tear of the vagina or perineum, and no hemorrhage from the pubiotomy wound. The child was born alive in good condition, weighed 3275 grams and presented the following head measurements: 13.25, 11, 9, 9.25 and 6.75 cm. There was a deep mark over the forehead from pressure exerted by the tip of the sacrum.

A lead tape outline of the suboccipito-frontal diameter when applied over a diagram corresponding to the measurements of the pelvic outlet showed that spontaneous delivery would have been impossible.

The puerperium was uneventful, the highest temperature being 100.4 degrees. The patient was catheterized but once, turned spontaneously in bed on the third day, was on the twentieth day and discharged six days later. At that time the following note was made: outlet excellent; cervix not torn; uterus retroflexed and movable; appendages not felt. Some induration in left labium majus; slight callus on anterior, but none on posterior surface of pubic bone. Sacro-iliac joints normal, locomotion excellent, definite motility at bone wound.

The patient was seen three months later, when she stated that the results of the operation had been perfectly satisfactory, and that she was able to attend to all of her duties without discomfort.

CASE XII.—Frazier, Obst. No. 3211. Colored i-gravida, age seventeen years. Generally contracted pelvis: 21, 23.5, 26.5, 17.5 and 10 cm. Pubic arch narrow, transverse of outlet 8 cm.

The patient was in the ward nearly one month before labor; pains commenced at 7.30 P. M., November 23, 1907. Vaginal examination at 2.50 P. M. the next day showed that the cervix was 5 to 6 cm. in diameter, the child in R. O. T., with the posterior parietal presenting. When I saw her at 7 P. M., after three hours of strong second-stage pains, the cervix was completely dilated, the head movable at the superior strait, with the sagittal suture just behind the symphysis and the right ear over the promontory of the sacrum. There was a marked caput. In view of the persistent posterior parietal presentation, pubiotomy was determined upon.

Operation, November 24, 1907: After preliminary dilatation of the vaginal outlet, the saw was applied by Döderlein's method and the left pubic bone severed without great difficulty. Forceps were applied to the sides of the head, which did not descend in spite of vigorous traction, the ends of the bone gaping only

2½ cm. On introducing a finger through the upper incision, it was found that the bone was held together by some of the fibers of the anterior pubic ligament, but upon severing them separation occurred to the extent of 5 cm. and the head was readily brought to the outlet and finally delivered by Ritgen's maneuver. There was slight hemorrhage during the operation.

The child was deeply asphyxiated when born, but was resuscitated without great difficulty. It weighed 3250 grams and presented the following measurements: 14, 12.5, 9.5, 9.25 and 8.5 cm.

The perineum or vagina were not torn, but upon inspecting the external genitalia it was found that a deep tear had occurred on the left side of the vestibule which extended from the anterior margin of the vaginal opening to above the clitoris, whose left crus had been torn through. The urethra was not involved. A finger introduced into the tear could be brought out through the upper pubiotomy incision and came in contact with the cut ends of the pubic bone. The laceration was closed by interrupted catgut sutures except at its apex through which a small iodoform drain was passed.

The puerperium was uneventful, the highest temperature reaching 102 degrees on the sixth day. The patient had difficulty in voiding and required catheterization for a number of days. There was some swelling about the left labium majus and a fistulous tract persisted for some days at the upper end of the vestibular wound, which, however, closed spontaneously. The patient sat up on the twentieth day and was discharged on the twenty-sixth day.

At that time the pubiotomy wound was found healed by first intention, there was no induration or swelling of the vulva, the outlet was excellent, the cervix had a slight stellate tear, uterus retroflexed, movable and well involuted, appendages not felt. No trace of the bone wound could be felt on either surface of the pubis. There was apparently no motility on passive movement of thighs. Locomotion was excellent and the patient presented no subjective symptoms.

CASE XIII.—Turner, Obst. No. 3337. White ii-gravida, twenty-five years old, entered hospital in labor, March 11, 1908. Generally contracted funnel pelvis: 20.5, 26, 29, 18 and 11 cm. Pubic arch narrow, transverse of outlet 7 cm.; anterior sagittal, 5; posterior sagittal, 6.5, and antero-posterior diameter 9.5 cm. Former labor very difficult on account of the outlet contraction, child died from fractured skull after a most difficult low forceps operation.

Labor began 5 p. m., March 11; cervix completely dilated and membranes ruptured at 6.15 a. m., March 12. At that time the child lay in L. O. T. with head movable at superior strait. As engagement had not occurred two hours in spite of strong pains, it was determined to perform pubiotomy, in view of the past history.

Operation, March 12, 1908: Preliminary manual dilatation of vaginal outlet, Döderlein subcutaneous pubiotomy on left side. The head was readily brought to the vulva and delivered without the use of traction rods, the ends of the pubic bone gaping $4\frac{1}{2}$ to 5 cm. There was very little hemorrhage. The perineum or vagina was not torn, although there was a slight tear in the vestibule to the left of the urethral opening, which was repaired by two catgut sutures. The child was born in good condition, weighed 3820 grams and presented the following measurements: 14.5, 11.5, 9.75, 9 and 8 cm. A lead tape moulding of the suboccipito-frontal circumference of the head applied over a diagram of the pelvic outlet clearly showed that spontaneous labor could not have been expected.

The puerperium was uneventful, the highest temperature being $99\frac{1}{2}$ degrees. The patient was catheterized for the first two days, but suffered very little discomfort. On the fifth day she turned freely in bed, sat up on the fifteenth day and was out of bed on the eighteenth day. At discharge on the twenty-fifth day the pubiotomy wound was found to be well healed; no callus on the posterior surface of pubic wound and very little on anterior. No motility on passive movements of thighs; locomotion normal and without pain. Six weeks later her condition was most satisfactory in every respect, and she was able to do everything which she had done before the operation.

CONCLUSIONS.

1. In thirteen pubiotomies performed at the Johns Hopkins Hospital there were no maternal and three fetal deaths, only one of which was attributable to the operation.

2. All patients were delivered immediately after the operation by forceps or version. There were no injuries to the bladder, three perineal, and only one deep communicating vaginal tear, notwithstanding the fact that nine of the patients were primiparæ.

3. The relative infrequency of injury to the soft parts is attributed to the employment of Döderlein's technic, but particularly to extensive, preliminary, manual dilatation of the vagina and perineum.

4. The after-treatment is not so onerous as is generally stated and is greatly facilitated by the use of the Bradford frame. Immobilization of the pelvis is not necessary. The patients usually move spontaneously in bed on the third or fourth day, get up on the twentieth day and are discharged on the thirtieth day with satisfactory locomotion. Healing generally occurs by the formation of fibrous tissue, and in at least one-fourth of the cases there is definite motility between the ends of the bone.

5. The maternal mortality should be less than 2 per cent., provided the operation is performed by competent operators upon uninfected women, who have not been exhausted by previous attempts at delivery.

6. It is indicated in contracted pelves in which the conjugata vera does not fall below 7 cm., and after a test of several hours in the second stage of labor has shown that the disproportion between the head and the pelvis cannot be overcome, as well as certain cases of outlet contraction.

7. In multiparæ with a history of repeated difficult labors or in primiparæ presenting excessive disproportion, it is inferior to Cesarean section performed at the end of pregnancy or at the onset of labor. In other cases it does not enter into competition with it; as it is the operation of choice in border-line pelves after the patient has been subjected to the test of labor, and at that time is five or six times less dangerous than Cesarean section.

8. It should replace high forceps, prophylactic version, induction of labor and craniotomy upon the living child in uninfected women.

9. It should not be employed in infected patients or after failure to deliver by other means. It should be regarded as a primary operation, whose dangers are infection, deep tears and hemorrhage.

1128 CATHEDRAL STREET.

THE CHOICE BETWEEN THE INTRAPELVIC AND
ABDOMINAL METHODS OF DELIVERY IN THE
LESSER (NON-ABSOLUTE) DEGREES OF
MECHANICAL OBSTRUCTION.*

BY
EDWARD REYNOLDS, M.D.,
Boston.

It must not be forgotten that it is still true that operative obstetrics covers, and should cover, but a small percentage of the gross amount of obstetric work, and with the operative movement which is coming over the speciality it is perhaps not unwise to emphasize at the beginning of any such discussion as this that successful normal labor is still, and must always remain, the best method of delivery.

In the percentage of cases which are necessarily operative,

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the choice between the different methods of delivery which are possible must depend upon consideration of the relative maternal and fetal mortalities and morbidities which may be expected of the different methods under the conditions of the individual case, and the consideration of this question is our present subject.

The dangers of intrapelvic operating to mother and child are all of them those which result from hard or rapid pulling. When the conditions are such that extraction is possible without hard pulling, the intrapelvic operations under modern conditions and in skilled hands are minor operations. When such ordinary indications as inertia uteri, malpositions, prolapsed cord, etc., make operative extractions necessary in cases with large pelves and lax soft parts, as in multiparæ who have always had easy labors, any experienced obstetrician knows that he can extract by the intrapelvic methods with a minimum of danger so exceedingly small as not to exceed that of ordinary labor to either mother or child. In these very easy cases the only element in which the disadvantages of the operative extractions can really be held to exceed those of natural labor is in a possibly somewhat greater risk of the minor lacerations, but in multiparæ with really lax soft parts even this disadvantage is a very small one. Modern obstetrics applies these extractions fearlessly to conditions which but a few years ago would have been allowed to drag along unendingly. Unnecessary as it may seem to insist upon such a point in this presence it is, again, perhaps important at the present moment that this society should emphasize in its presentations that for such simple cases any contemplation of the Cesarean section is out of order.

It is only when operation is indicated for mechanical obstacles, whether due to the shape and dimensions of the bones or to abnormal conditions of the soft parts, and when these obstacles are of such degree as to involve hard pulling, that the question as between the intrapelvic and abdominal methods of delivery is in order. This question may eventually be decided in any case in favor of one or the other side, but it should certainly be considered in every such hard case.

As has been already said, both maternal and fetal mortalities and also morbidities must be given consideration in making the choice, but the Anglo-Saxon profession will still be disposed to admit, and indeed to uphold strongly, the long-established Anglo-Saxon belief that the maternal mortality is the more important of the two death-rates and should exercise a preponderating in-

fluence in the choice of methods whenever it can be shown to be markedly variable as between them. It is only when the mother is already moribund or when the maternal mortalities are essentially equal that the choice of methods should depend upon their relative fetal death-rate. Similarly, mortality is always more important than morbidity, and it is only when mortalities are essentially the same that relative morbidities become important, but in such cases they also may often cast the deciding vote.

If, then, maternal mortality is to be the first and most important consideration in the decision, much must depend upon the period of labor at which the indication for operation arises, and this point is so important that it must for the moment take precedence of the other indications.

Although the maternal mortality of the intra-pelvic methods increases somewhat with the progress of maternal exhaustion before operation is undertaken, it increases but slowly, while that of the abdominal method increases much more rapidly. If, then, again, maternal mortality is to be the first consideration, it follows that during the later part of labor the use of the abdominal method should be restricted to the absolute indication, *i.e.*, to those few cases where no intrapelvic operation is possible; but if, on the other hand, it can be shown that earlier in labor the maternal mortalities of the two routes are equal or not greatly different, then at that time the choice of methods in cases which are necessarily operative should be made or partly made by consideration of their relative fetal mortalities, and maternal and fetal morbidities.

These two propositions I believe to be tenable, and it is these two propositions that I first wish to bring before you by a little more detailed consideration of the advantages and disadvantages of the two methods, and more especially of their mortalities, considered late in labor, in the course of labor and at the beginning of labor.

It would seem at first sight that it should be exceedingly easy to ascertain statistically the mortalities of the intrapelvic operations which are so constantly performed. I have been surprised to find that it is not easy. I have been unable to find any statistics which are at once authoritative and recent. An analysis which I made some time ago of results obtained at the Boston Lying-in Hospital showed seventy-five consecutive high operations with no deaths, and in my own experience both when connected

with the staff of that institution and in consultation practice I can now remember but two deaths operated upon for mechanical indications only. Most authorities content themselves with stating on this point that the maternal mortality for the intrapelvic operations is undoubtedly present, but undoubtedly low. Excluding pathological conditions which have their own death-rate, and should be considered as separate questions under their own individual headings—in short, confining the question to cases of mechanical obstruction or relative mechanical obstruction only—it could probably be reduced to the rare accidental mortalities; indeed, where the mother is in fair condition at the beginning of the operation and in skilled hands from the beginning of her labor, it should probably not rise above 1 per cent. Even here it is difficult to make more than an estimate of this mortality. There are probably comparatively few men even in this room whose personally-conducted high extractions can be reckoned by the hundreds and they would probably be the first to admit that a hundred consecutive operations of this kind with but one death from any cause was a creditable performance. Under less favorable conditions and in less skilled hands the maternal mortality of these operations is probably very considerably higher. The most essential point in this connection is, however, that while the maternal mortality of intrapelvic operations in moderately neglected labor, *i.e.*, after the appearance of moderate maternal exhaustion, is undoubtedly higher than when the operation is done at the time of election, it is not very greatly higher.

In contrast, the maternal mortality of the late Cesarean section is very large, rising in accordance with the amount of maternal exhaustion which is present at the time of operation, from a mortality of perhaps 5 or 6 per cent. at the time when the signs of exhaustion are first to be definitely detected, until in long-neglected labor it would probably be conservatively stated if placed at 25 per cent.*

The fetal mortalities of the intrapelvic methods performed late in labor are undoubtedly very high, while the fetal mortalities of the late section remain low, but the maternal mortality of the late section is so great that it will be generally conceded by the Anglo-Saxon profession that it should never be chosen while

*For more careful consideration of these mortalities consult statistical statement in Transaction of the American Gynecological Society, 1907. Boston Med. and Surg. Journal, October 31, 1907.

the extraction of a living child by the intrapelvic methods is in any way probable. Indeed, if we are to adhere to the time-honored principle that whenever the interests of the mother and child are distinctly opposed to each other, the life of the mother is the more valuable, the classical section in neglected labor should be excluded from consideration, except in the rare cases in which the delivery of even a decerebrated child is impossible, or when the mother is already moribund and the child alive. Most of the leading authorities now concede this principle, and I wish to be on record as most emphatically in support of it. In these unfortunate cases the intrapelvic route is always the method of choice so long as it is possible; when it is impossible the choice between craniotomy, Frank's recent operation of extraperitoneal section, perhaps the old-fashioned Porro operation, and perhaps in a very few cases the otherwise discredited divisions of the pubes, is still *sub judice*, but is a question into which lack of space forbids me to enter here.

The late section, that performed after the advent of definite exhaustion, is never a method of choice. When, however, in the absence of the absolute indication the question of the choice between the abdominal and intrapelvic methods of extraction is first brought up at the time of election for forceps or version—*i.e.*, after the presence of fairly prolonged labor, and before the advent of actual exhaustion—we are confronted by a different question. Under these circumstances the maternal mortality of the intrapelvic operations when performed for mechanical indications only and under reasonably favorable circumstances is essentially above 1 per cent. while, on the other hand, the maternal mortality of the section performed at this time—the secondary section—may be fairly summarized as varying with the circumstances of the individual case between 2 per cent. and 5 per cent.,* though the fetal mortalities of the intrapelvic methods are undoubtedly considerable while the fetal mortalities of the section should be *nil*. Under these conditions, it is probable that if for any reason the choice rests wholly with the surgeon, he should revert to the long-established Anglo-Saxon principle that the mother is more valuable than the child; *i.e.*, that he should, if he is acting upon his responsibility only, choose one of the intrapelvic methods as the safest road for the mother, even if it involves an increased risk to the child. Upon the other hand, if after fair and impartial statement to them of the probabilities,

* *Loc. cit.*

the parents consent to a slightly increased maternal risk for the sake of a great increase of safety to the child, it is certainly rational to believe that the choice is theirs and that the surgeon should obey their bidding. This question should never, however, be permitted to arise a second time in the labors of the same woman; the same mechanical conditions will again be present, and after one such experience her subsequent labors should be dealt with by the far safer primary section.

When for any reason it is apparent at the beginning of labor that the case must eventually be dealt with by some operative method, the problem is a simple one and easily to be determined by the relative advantages of the two methods as operations of choice.

Under these favorable circumstances the maternal mortality of the intrapelvic methods should not rise above 1 per cent. but when performed for mechanical obstacles their fetal mortalities must always be considerable.

The maternal mortality of the primary section has been reported as of no per cent.* It is certainly very low, but so far as my knowledge of the literature has enabled me to judge there is to-day no man living who has performed one hundred consecutive primary sections, and although I think it would be possible to make from the literature of the subject more than one collection of a hundred primary sections done by a number of operators during a given time, with a death, this could only be done by careful effort toward this end, and in an unprejudiced search it is probable that even in this simple and safe operation an accidental death-rate of some sort would always crop up. It may probably be fairly estimated at about 1 per cent., or at all events as essentially similar and equal to that of the intrapelvic methods under the same favorable circumstances. Its fetal mortality is, upon the other hand, *nil*, and its percentage of subsequent morbidity is much less than that of the intrapelvic operations.

This last statement may bear a moment's examination. Much has been written about a liability to painful adhesions, rupture of the uterus in subsequent labor and hernia in the scar after Cesarean sections, but I am sure that careful study of extended reports of cases will show that the liability to these disabilities is largely a bugbear in the class of sections which we are now considering. Adhesions undoubtedly occur after sections during neglected labor or upon infected uteri, but no abdominal

*F. Fromme. Berliner Klin. Wochenschr., Jan. 27, 1908, No. 4. 45 Jahrg.

operator of any experience needs to be told that the chance of troublesome adhesions after simple, rapid, favorable operations is exceedingly small, almost negligible. Rupture of the uterus in labors subsequent to the Cesarean section has undoubtedly occurred, but it is self-evident that if the mechanical conditions are such that a woman has once been rightfully subjected to a primary Cesarean section, she should not be allowed to go into labor at all in subsequent pregnancies, but should be again treated by the primary section. So, too, in the lax state of the abdominal wall after Cesarean sections and with modern methods of suture, hernia of the scar is becoming negligible in clean operations. Upon the other hand, the extensive lacerations, the disturbances of the urinary functions, the varied mechanical gynecological lesions which follow the difficult intrapelvic extractions in no small percentage of cases need no elaboration before this audience.

For those cases in which it can be known beforehand that delivery must eventually be done by some operative method, the primary Cesarean section is the operation of choice.

Theoretically, it is, then, desirable that all cases which are eventually to be submitted to the Cesarean section should be operated upon before labor. Practically, it is impossible to recognize all such cases in advance, but it may be laid down as a rule that *all* cases which can be recognized as such in advance should be operated upon by the Cesarean section, done at term in advance of labor or with the first pains, in order to secure the time of least maternal and fetal mortality and morbidity; and the most important opportunity for progress now before the obstetrical world lies in the effort to acquire increased power to recognize difficult cases in advance of labor.

In point of fact, the amount of power which our present knowledge gives us in this direction has been underrated and overshadowed by remembrance of our great weakness on this point in the past. It involves the study of all the mechanical and vital indications for the choice between the different methods of operative delivery as well as between operative delivery and natural labor; but as soon as one turns his attention definitely to this matter, a very few years of experience will convince him that the number of cases in which fairly positive predictions can be made is larger than he had supposed.

For this purpose multiparæ and primiparæ must be placed in different categories. Multiparæ with mechanical difficulties

reach the specialist either because of one or more previous stillbirths or because they have themselves suffered severely in previous operative deliveries. In such cases, after the obstetrician has subjected the patient to the fullest possible physical examination, including a diagnosis of the shape of the individual pelvis, and the measurement of its diameters, and has checked the information so gained by careful consideration of the history of previous labors, including not only their duration, but the character and efficiency of the pains, he should inform himself of the patient's general physical condition and "*staying power*" not only by a general medical physical examination, but by careful study of her history of past fitness or unfitness for exercise and sustained athletic effort and by the history of her condition, habits and of the care given her during the preceding pregnancies, with her improvement or loss of condition therein. He should then conduct the hygienic care of her present pregnancy, and watch her general functional and muscular condition as it progresses; and should finally estimate the exact mechanical conditions by a careful pressure examination of the relations between the individual pelvis and head made at term when there is no longer hesitation about the possible provocation of labor by such an examination. When all this has been carefully done, an experienced man is really in a position in which he can judge with considerable accuracy of the labor which is to be expected, remembering that we are at present limiting ourselves to the consideration of multiparæ with definite mechanical difficulties. (If the patient is in her second pregnancy, the attendant must carefully estimate from the history and the present condition of the soft parts the amount of subtraction from the difficulty of her previous labor which should be allowed for her primiparity at that time; but if she has had more than one previous difficult labor, this source of difficulty is removed.) After all this amount of preparation, which is, however, no more than should be given to the study of any important case, there are but few cases in which a really experienced obstetrician cannot assign the patient to one of two provisional classes: (a) That in which the degree of mechanical difficulty, estimated in connection with the characteristics of the patient and the history of the past labors, convinces him that there is a fair chance of a spontaneous passage of the brim. If in such cases this fails to occur, there should at least be every probability of the delivery of a living child by the application of the intrapelvic methods, and to such cases properly

conservative surgeons will still apply the intrapelvic operations; or (*b*) the class in which there is little or no probability of a spontaneous passage of the brim and in which the only probable choice is that between the different methods of operative delivery. Here there is always a possibility of hard pulling in the intrapelvic operations, and how hard it may be no one can ever tell. Here the maternal mortalities of the intrapelvic and primary abdominal methods are probably equal, the fetal interest is clearly on the side of the section, and the chances of maternal morbidity from injury are almost wholly confined to the intrapelvic side of the question. Here, then, the decision of the question will be influenced largely by the mental makeup and degree of experience of the individual consultant. Some will still be influenced by tradition to the side of the painful, exhausting, dubious and always uncertain intrapelvic extractions; more will to-day decide in favor of the painless, safe and certain primary Cesarean section, the results of which can be clearly foreseen.

In multiparæ with mechanical difficulties, who have had previous unfortunate labors, and from whom the easy cases have been weeded out by painstaking study, I believe that there will be in the future but few deliveries other than by the primary Cesarean section.

In primiparæ the absence of the history of past labors makes the physical examination the more important element; but every primipara should be subjected to the same careful study of the vital and constitutional history for use in connection with the physical examination. In the lesser degrees of mechanical difficulty, the most obvious clinical division among primiparæ is that founded upon the age of the patient in connection with the state of her soft parts. Primiparæ of advanced age usually have lingering labors, owing to the less active condition of their uterine muscles and the lessened dilatibility of their cervices; yet, in the absence of bony mechanical difficulty the majority of them are in the end delivered by spontaneous labor, and where delay is due to the condition of the soft parts alone, it can usually be overcome better by early artificial dilatation than by any other method. When, however, such women present, in addition to their unfavorable uterine muscles and cervices, even moderate bony difficulties, the intrapelvic extractions are usually extremely hard and are liable to be attended not only by excessive lacerations, but by frequent loss of the child. In such cases, *i.e.*, primiparæ over thirty-five or thereabouts with rigid

cervices and even slightly small or ill-shaped pelves, the chance of spontaneous delivery is so small and the percentage of fetal mortality and maternal morbidity in the intrapelvic operations is so large that with about even maternal mortalities as between the two methods the primary Cesarean section is the better operation. It is further to be remembered that in these elderly primiparæ the fetal chances are always of great importance to the parents from the small likelihood of the mother's bearing many more children, and in this respect also the situation is quite different from that of the primipara of twenty, who, even though she loses one child, has yet the prospect of a large family before her. Even in elderly primiparæ, it is only in marked neurasthenics of very low muscular and nervous endurance that the primary section should be ever considered in the absence of bony obstacle.

In young, strong and elastic primiparæ the question is a different one. Here, with only moderate tightness of bony adaptation between the head and pelvis, the balance of a doubtful decision should probably always lean toward the intrapelvic operations, upon the basis that it is in such cases that we are least able to predict with any safety whatsoever the probable outcome of labor, and that the woman who has once gone through a labor, and if necessary an intrapelvic operation, will have in the future all the advantages of the multipara, both as regards the condition of her soft parts and also in the acquisition of that most useful of all guides—a knowledge of what her pelvic obstacle amounts to from actual experience in a previous labor; while she who is subjected to a primary Cesarean section as a primipara remains effectively a primipara, with undilated soft parts and with the same uncertainty about the actual problem in her second pregnancy.

Primiparæ, whether young or old, who have bony obstacle of such marked degree as to render spontaneous delivery impossible or essentially improbable, are from their very primiparity poor subjects for the intrapelvic operations and fit subjects for the primary Cesarean.

In summary, the positions which I wish to present to your consideration are: that while the elective Césarean section at the beginning of labor has been demonstrated to have, when performed under favorable conditions, no greater maternal mortality than the intrapelvic operations at the time of their election and a lesser fetal mortality, in combination with, upon the

whole, lesser morbidities to both patients, the maternal mortality of the section rises steadily in proportion to the length of labor endured before its performance, while the maternal mortality of the intrapelvic methods remains essentially stable until very late in labor; that it is, therefore, for the interests of the future of obstetrics that we should use every possible effort to extend the limits of our power of recognizing in advance those cases which are to be necessarily operative.

That while mere routine measurement of the pelvis presents, even when combined with estimation of the size of fetal head, a very imperfect means of making such predictions in advance, careful and, if necessary, repeated estimation both of the shape and size of the individual pelvis, as well as of the vital and muscular "staying power" of the patient, considered in connection with the past history in multiparæ, will furnish predictions, the accuracy of which will be even now surprising to those who have not given special study to this point, and which may be rendered greatly more efficient by systematic and general study in the future.

That such work is not as yet within the powers of the general practitioner, but should be decided by him only in consultation with qualified obstetric experts.

That, in the present state of our knowledge, in multiparæ with mechanical difficulties who have already had unfortunate labors, the presumption is that such results will be duplicated unless reason to the contrary can be demonstrated, and that such cases should, therefore, be subjected to the favorable primary section.

That in elderly primiparæ with mechanical difficulties and liable to the lingering labors characteristic of such cases and in whom, moreover, the present fetation is of especial value from the comparative unlikelihood of future pregnancies, the balance of choice should incline toward the more certainly favorable, primary, Cesarean section.

That in young primiparæ with moderate mechanical difficulties and for whom the prospect of repeated pregnancies is good, the balance of choice in the first labor should be toward the endurance of labor and the performance of the intrapelvic operations at the time of their election, should they prove to be necessary, upon the understanding that future pregnancies in these women will be treated upon the basis recommended for such cases in multiparæ.

PRESSURE CONDITIONS WITHIN THE ABDOMEN.*

BY

RICHARD R. SMITH, M. D.,

Grand Rapids, Mich.

(With Illustrations.)

INVESTIGATION into the question of pressure conditions within the abdomen has not been as extensive as the importance of the subject would seem to demand. To the gynecologist and obstetrician the theme is, perhaps, one of theoretical rather than practical interest, and yet it seems quite necessary in considering many and various pelvic and abdominal conditions that our ideas in regard to it may be clear. This is perhaps particularly so in discussing uterine displacements and the mechanism of labor—matters we will not enter into here except to suggest a more accurate application of the facts brought out. The obstacles attending experimental work in this direction are apt to be great and sometimes apparently insurmountable. Every real advance in our knowledge of the subject, however, has been made only in this direct way or by means of clinical observation. To be sure, a concise knowledge of certain laws is necessary to a proper understanding, but the conditions are so complex that one is easily led into error if he depends alone upon his knowledge of physics. In fact, the application of such laws to one's theories has resulted in about as many mistakes as purely theoretical speculation. When, for example, Meyer asserts that so-called negative pressure cannot exist within the abdomen because the abdominal walls are elastic and would meet at once any such difference of pressure, he did not take into consideration that all the walls are not elastic—a circumstance which materially affects the results. Much that has been taught has been erroneous. Barrett, in a very recent article, points out a number of such errors and pleads for more accurate teaching along this line. Among the grossest of these in the literature of the past may be noted (*a*) the so-called retentive power of the abdomen—a theory that atmospheric pressure upon the abdominal walls (and perineum) is a factor in the maintenance of the pelvic organs in a proper position and (*b*) that the uterus is held in anteversion because

*Read at the meeting of the American Gynecologic Society, Philadelphia, May 26-28, 1908.

of the inability of two peritoneal surfaces (bladder and uterus) to leave one another. With the advance of gynecology and obstetrics and the recourse to direct experiment and observation rather than to theory, our ideas on this subject have also been bettered. A reference to a few of our latest text-books shows neither of these factors mentioned as having to do with uterine support (Bovée, 1906, article by Goffe; Dudley, 1904; Hirst, 1905; Kelly, 1906, Kelly-Noble, 1907; Reed, 1901; Veit, 1907, article by Küstner). Ashton, 1906, however, speaks of the retentive power of the abdomen. This teaching seems to have come from Duncan (1865), who has been extensively quoted. Many text-books, even very recent ones, in considering the etiology of displacements of the uterus, speak of intraabdominal pressure much as though it were the direct downward pressure of a solid body. Few have attempted to take up the matter in detail. Küstner (Veit's Handbuch), however, devotes a short chapter to it. Even in the literature devoted exclusively to the subject, the term "abdominal pressure" seems to have led to a definite conception of an ever-present and universal positive pressure independent of conscious muscular strain. This use of the term has led to some rather interesting and energetic controversy. The term is, perhaps, rather indefinite, but hard to avoid. Certainly in our text-books it is commonly meant to signify that pressure brought about by contractions of the muscular walls of the abdomen, and in this sense, at least, has a legitimate use. We shall use the term without further apology, hoping that the context will explain its intended meaning.

My purpose in this paper is to set forth, as briefly and clearly as possible, the main points of what has already been accomplished toward a better understanding of the subject and to plead for greater accuracy in the application of the facts as they exist. My own observations are limited to a considerable number of informal clinical investigations and experiments made during the past few years.

Let us describe in brief the conditions with which we have to deal: The abdomen is an air-tight cavity, lined with a smooth membrane, the peritoneum, and filled with organs covered in the same way and permitting of great freedom of movement and change of position. The hollow organs have muscular walls of their own which produce special pressure conditions not to be dealt with in detail here. Some of the walls of the cavity are rigid, some distensible, so that a very considerable change in the

form and volume of the cavity is readily permitted. The posterior wall is fairly rigid and allows of but little movement and change in form. Above, is the so-called thoracic abdomen, the walls of which are noncollapsible, but do permit of considerable contraction and expansion. Between the abdomen and thorax is a thin muscular partition, the diaphragm. Beyond the diaphragm, the elastic lungs, tending always to draw the diaphragm upward. Below is the pelvis, bordered on four sides by rigid walls. Its lower outlet is closed by a strong wall of fascia and muscle which gives a little under strain. Great change in the form and position of the abdominal contents is permitted, chiefly through the expansive anterior wall, composed also of muscle and fascia. The solid organs, including the uterus in non-pregnant state, lie protected from injury in the less collapsible portions of the abdomen (the pelvis and thoracic abdomen). Their attachments allow of some considerable, but still rather limited, change in position. The attachments of the intestines, on the other hand, permit a much greater range. They commonly occupy the central portions of the abdomen, but readily retract into the pelvis or lateral fossæ when occasion demands. This is especially so of the small intestine. The middle portion of the abdominal cavity, by means of its flexible anterior wall, is capable of a wide range of capacity. When the alimentary canal is empty the anterior and posterior walls may be found in thin subjects lying in close proximity, or they may lie far apart, enlarging the cavity to take care of the increase of volume due, most commonly, to filled intestines, the bladder, pregnancy or some pathological condition. Under such pressure conditions as exist within the abdomen, there is never, of course, a vacuum. The contents fill the containing walls completely. The organs lie one upon another or on the walls with which they come in contact. The volume of the abdominal contents cannot be very largely varied by the differences of pressure which exist under ordinary conditions. The solid and fluid contents are almost absolutely incompressible;* the gas alone is capable of it. When we

*It might be well to add that straining at stool, lifting, and straining in parturition cause a sustained positive pressure of high degree, and a consequent forcing of blood and lymph already in large abdominal vessels into the thorax, but a blocking of any further entrance of venous blood or of lymph into the abdomen, thus backing it up in the veins of the lower extremities. A little diminution of volume would be thus produced. An exception may be found upon the upper surface of the diaphragm within the pleural cavity where pressure is always diminished owing to the elasticity of the lungs. The diaphragm forms, of course, one of the walls of the abdomen.

consider that this gas is already under an atmospheric pressure of about ten meters water column and that (according to Boyle's law) "at a constant temperature, the volume of a given amount of gas varies inversely to the pressure to which it is subjected," we may readily see that even under extreme over-atmospheric conditions, say of one and one-half or two meters water column, that the volume would be diminished but a small fraction.

Atmospheric Pressure.—Upon the walls of the abdominal cavity, as well as upon the body and objects elsewhere, there is constantly exerted the pressure of the atmosphere equal, say, to about ten meters water column, or, more familiarly speaking, say, between fourteen and fifteen pounds to the square inch (reckoned also as 1033 grams per square centimeter). If the

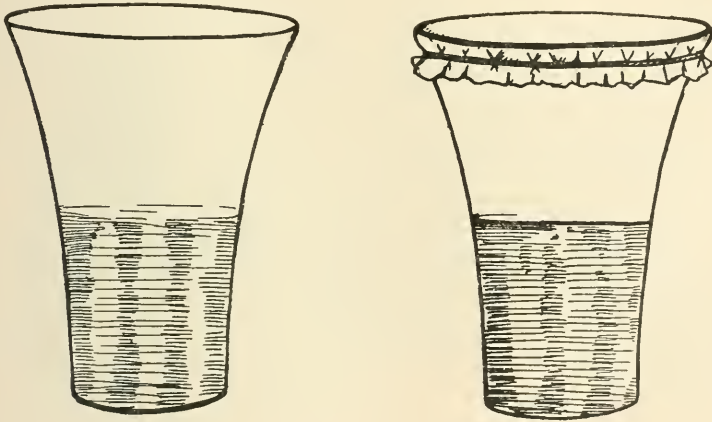


Fig. 1

abdomen were a vacuum, it would, of course, be crushed. However, this is met by an atmospheric pressure equal in degree to that outside. In an open glass of water the pressure within and without are the same. The simple act of closing the glass with a membrane does not disturb the balance, but simply makes possible certain phenomena by preventing under circumstances a perfect balance of in and outside pressure. (Fig. 1.) In the abdomen *any variations* from this normal equilibrium are to be explained by factors to be enumerated later.* By *positive*

* We may, of course, artificially vary the external pressure by high altitudes, air chambers, etc., but for purposes of simplicity we will speak only of ordinary atmospheric conditions.

pressure we mean, of course, *over-atmospheric* pressure and by *negative pressure* we mean an *under-atmospheric* pressure.

FACTORS WHICH RAISE OR LOWER ATMOSPHERIC PRESSURE WITHIN THE ABDOMEN.

1. If we place a normal woman in a horizontal dorsal position upon a table and there is no voluntary straining of the muscles, the pressure just beneath the anterior abdominal wall will be almost the same as outside—the balance is almost exact (Fig. 2). I say directly underneath the abdominal wall because in deeper portions a positive pressure will be indicated, a matter to be discussed later. That this balance is almost exact can be demonstrated in a number of ways. First, by experiments on animals.

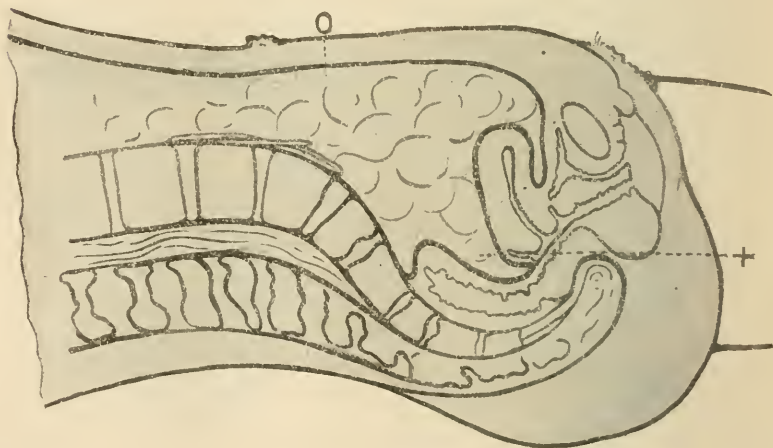


Fig II

Hörmann has passed into the abdominal cavity of dogs and to a point just beneath the abdominal wall a trocar connected with a monometer. The same experiment has been carried out also by Qurin and Kelling. Only the slightest differences of pressure have been noted; at the most, perhaps, one or two centimeters water column. The same fact may be demonstrated upon the operating-table. If our patient, likewise in the horizontal dorsal position, is relaxed when the abdomen is opened, the viscera will protrude but little, if at all, and there is no inward rush of air. Should the former take place, we conclude that she is straining. It might be argued that these conditions were abnor-

mal, since the subject is under an anesthetic. On a number of occasions I have repaired, without anesthesia, an abdominal wall ruptured during the convalescence from operation: the viscera were easily returned to the abdomen and showed no tendency to protrude unless the patient were straining. Again, if one examines, in this same relaxed, dorsal horizontal position, a patient with a ventral hernia, he will find the sac relaxed. All of these facts easily disprove any idea of a constant special positive pressure within the abdomen such as we find argued by Schatz in his classical monograph upon the subject, published thirty-five years ago. This same idea has been very prevalent. Schatz was led to this conclusion by a series of experiments he made upon himself. He inserted an incompressible canula into the rectum and connected the same with a monometer. He noted the higher readings due to upright positions of the body, but ascribed them to differences of muscular tension and not to hydrostatic pressure. It has been shown by Braune and Kelling that intraabdominal pressure is not increased by the eating of food, a full bladder or large rectal injections of water. Moritz and Hörmann have examined a large number of pregnant women near full term and have noted no, or only insignificant, differences of pressure. Kelling, on dogs, has shown that the volume of the abdominal contents might be increased 100 per cent. without any distinct rise. In obese animals it is found that the limit is reached earlier than in thinner ones. The volume of the abdominal contents may then be increased by almost any physiological condition with insignificant, if any, rise of pressure. Once these limits are reached and the walls put upon a stretch, the pressure rises rapidly. In this connection, the results of Hamburger are of interest. In the course of a series of experiments on dogs to determine the effect of abdominal pressure on absorption in that cavity, he found that when such pressure was raised about 30 cm. water column that absorption was diminished and the blood pressure rapidly fell. Above 40 cm. w. c. serious symptoms or death were produced if not immediately relieved. In pathological conditions Hörmann has found that tumors of considerable size and moderate amounts of ascites were attended by no increase in the abdominal pressure. This, of course, varies in different subjects. Qurin found that ascites causing any marked increased pressure was attended by dyspnea and other serious symptoms. In other words, there seems to be a marked tendency to maintain the abdominal cavity at or near a balance

of atmospheric pressure, and we may presume that the functions are best maintained in this way.

2. The abdomen has often been compared to a vessel containing a viscid fluid. If we do not carry it too far, we are justified in the comparison and may note in a series of most important phenomena the laws which govern fluids. We may bear in mind the following:

First.—The downward pressure of a liquid is proportionate to its depth and density (Fig. 3).

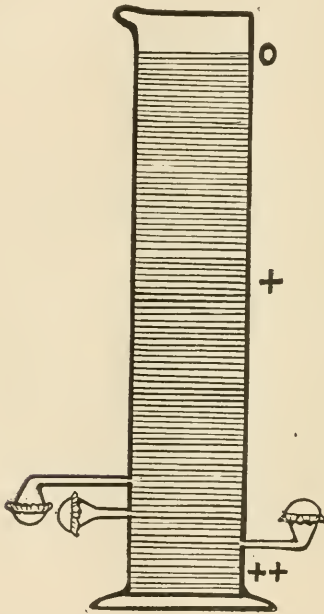


Fig. III.

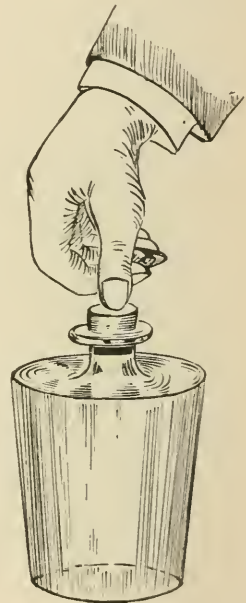


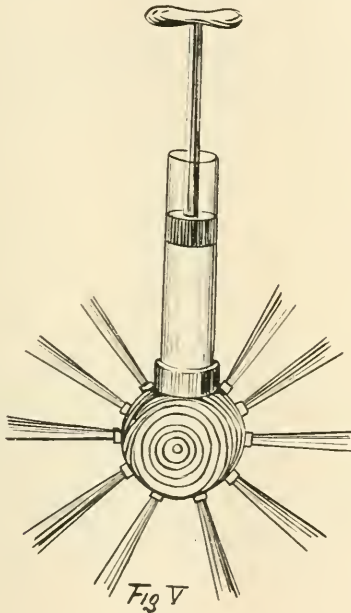
Fig. IV

Second.—Fluid pressure at a point of a fluid at rest is of the same intensity in all directions (Fig. 3).

Third.—Pressure applied to any area of an inclosed fluid is transmitted in all directions and without diminution to every part of the fluid and of the interior of the containing vessel (Figs. 4 and 5).

If we compare the abdomen to a vessel containing a liquid, we would suppose that if we were to measure the pressure at the bottom of the cavity we would find it greater than at higher levels or, to put it in another way, if we measure the pressure in the

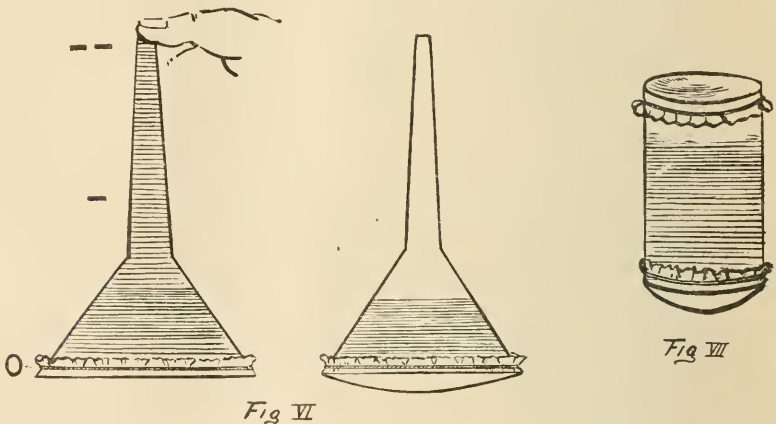
pelvis, in an upright position of the body, we would find it lessened when we change such position. All experiments made to determine this point go to show that such is a fact. Exact figures cannot be obtained in the rectum and bladder, for special conditions prevail, owing to their muscular walls; measurements in the stomach are still less exact, because of the irritation of the tube. When sufficiently extensive and when comparative, they are of value in determining gross results. Hörmann, for example, in experiments made on eleven patients, showed a positive rectal pressure in the upright position, varying from 16–34 cm. water



column. In eleven others in the knee-chest position, he showed a negative pressure varying from -2 to -14 cm. In his experiments on dogs, he inserted a canula connected with a monometer into different parts of the peritoneal cavity, varied the position of the animal and noted the readings. He showed clearly that higher readings were obtained at lower levels. Such increase is undoubtedly due to the weight of the superimposed organs. (As in the graduate, Fig. 3.) These results may be determined on the human subject in a number of other ways. In the upright position the bulging of the perineum and lower abdominal wall, the extrusion of herniæ or of a prolapsed uterus may all be used

as demonstrating the increased pressure at these points. It disproves the old idea that the abdominal organs are altogether supported by their ligaments and mesenteries, but does not by any means definitely demonstrate that all such weight is borne by the exposed walls. The matter is complex. Measurements taken from the hollow organs lack the necessary accuracy to determine the point. The density of the total volume of the abdominal contents varies with the amount of intestinal gas present, and we have not as yet figured on a possible supporting influence from a negative pressure in the thoracic abdomen due to its rigid walls. The latter point will be shortly discussed.

3. That an under-atmospheric or negative pressure may exist in the parts uppermost at the time in the abdomen may be demonstrated in a number of ways. A simple laboratory experiment will illustrate the idea (Fig. 5). Let us close the small end



of a funnel with the thumb, fill it with water, close the larger end with an elastic membrane and reverse it. In the upper portion we have an under-atmospheric pressure due to the weight of the water column beneath and which is shown by withdrawing the thumb, when the membrane bulges and the air rushes in. Another experiment, probably more nearly approximating the real condition can be made by closing either end of a vessel with elastic membrane (Fig. 7). The contained water sinks, negative pressure is produced in the upper portion, as can be shown by the indented membrane. The same thing is shown by the common experiment of reversing a vessel in an open dish as in Fig. 8. Hörmann, in a series of experiments on animals, has shown that

in certain positions of the body a pressure may exist in the parts which are uppermost in the abdominal cavity, provided such part are rigid enough to resist the pressure of the atmosphere. He suspended from the shoulders dogs which were anaesthetised or freshly killed and passed into the upper abdomen a canula connected with a monometer. A slight under-atmospheric pressure was noted. He also placed the dogs horizontally, ventral wall down, with the weight supported by the thorax and pelvis, the anterior wall hanging free; a negative pressure was noted in the lumbar region. This matter is every day demonstrated in the human subject (Fig. 9). With the woman in the knee-chest

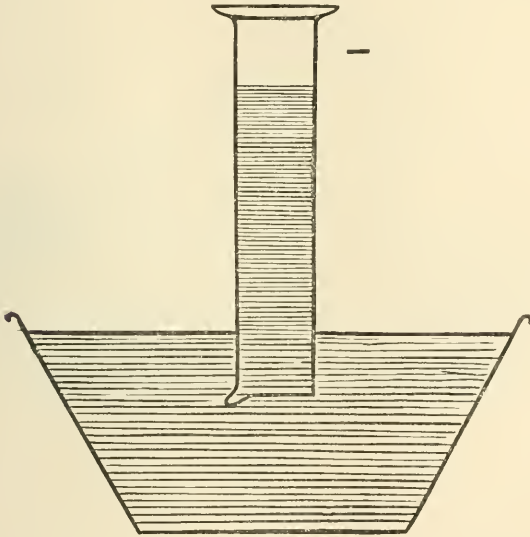


Fig VIII

position, and relaxed, the weight of the viscera carries them toward the diaphragm. The walls of the pelvis are rigid. That a negative pressure exists within is shown by releasing one of the muscular sphincters with a speculum. Air rushes in to fill the rarified space. Again, one may demonstrate the same phenomenon on the operating-table. If the patient is placed in the Trendelenberg position, with muscles relaxed, and the common subumbilical incision is made, the moment the peritonaeum is incised, the air rushes into the abdomen to fill the space under less tension.

The question whether in the upright position an under-atmos-

pheric or negative pressure may exist in the upper abdomen is one which has not been very clearly demonstrated in the human subject, and yet everything would point to its probability. Hörmann, in his animal experiments just cited, found such a condition in eight dogs ranging from -1 to -9 cm. water column. Mathes argues that since in the pleural cavity we have a negative pressure varying from -8 to -40 cm. water column (ex- or inspiration), that on the lower side of the diaphragm a similar negative pressure obtains when it is at rest or passive. Under such conditions a balance of pressure, namely, a negative pressure on either side of the diaphragm, is obtained in the upright posi-



Fig IX

tion, the weight of the abdominal organs opposing the upward tendency of the diaphragm and maintaining equilibrium. Hasse in experiments on cadavers, shows that in the upright position, if the abdomen is opened and air takes the place of the viscera, that the diaphragm moves distinctly upward.

4. The effect of respiration upon abdominal pressure has been investigated by a large number of observers with varying results. We may distinguish two types of breathing—the diaphragmatic and the costal; ordinarily it is mixed. In the diaphragmatic type abdominal pressure is slightly raised by inspiration; with the costal, it is slightly lowered. The change in form of the cavity is considerable, the increase and decrease of pressure but slight, at least in ordinary breathing. Mathes, in five women,

showed, by means of a colpeurynter in the vagina connected with a manometer, that in the prone position pressure was raised in inspiration; in the standing, slightly decreased. He argues, therefore, that the costal type prevails in women while standing and that the diaphragm is passive. In the prone position the conditions are reversed—the diaphragm is active the ribs more or less inert. From his measurements we may assume that such raising and lowering of pressure is in ordinary breathing moderate. Deeper breathing causes greater waves, his investigations would show also that it is greatest in robust individuals. Mathes argues, however, that the thoracic abdomen, because of thoracic negative pressure and consequent tendency of the diaphragm to move upward, plays a most important part in the support of the viscera. His argument is a strong one and lacks only actual demonstration in the human subject. A number of arguments might be brought to bear against it. I mention it as having a strong bearing on the subject and because of probable truth contained in it.

5. A most important component—perhaps for practical purposes the most important—is the pressure produced by the contraction of the abdominal muscles. Coughing, sneezing, defecation, labor and many movements of the body produce within the abdomen a positive pressure which may reach one, or even two meters water column. Such is to be added, of course, at any point in the abdomen to that pressure already existing there. It is sufficient, even when comparatively mild, to at once wipe out any negative pressure existing. One has only to cite the annoyance caused by the straining of the patient in making rectal, vaginal or bladder examinations in the knee-chest position. It plays a most important part in a number of bodily functions and is of prime importance in the mechanism of labor. Acting according to the law of hydrostatics already laid down, this pressure is transmitted in all directions and without diminution to every part of the contents and the interior of the abdomen.

As stated in the beginning, my object in this communication was to analyze briefly the principles and facts as we know them in regard to pressure conditions within the abdomen. There are many important matters still unsettled. It would be desirable, for instance, if we could know just what proportion of the weight is borne by the various components which give the different organs support, and pressure conditions are intimately connected with the question. It is to be hoped that there will be less in-

discriminate teaching in regard to the effect of pressure upon the position of the uterus. The teaching, for example, that abdominal pressure acts only on the posterior wall of the uterus in anteversion, and only on the anterior wall in retroversion, is open at least to serious doubt. It must act on all surfaces alike that are not protected by intervening structures. The pliable bladder may easily transmit the pressure to such portions of the anterior uterine wall as lie beneath the peritoneum. What has been accomplished for our better understanding of pressure conditions within the abdomen has come, almost entirely, from painstaking experiment. The matter is too complex to make any other course safe, and it is to be expected that further substantial facts will be gained only in the same way.

RESUME.

1. Atmosphere pressure within and without the abdomen is almost exactly balanced, any variations at any point being caused by factors to be enumerated. There is no special universal positive pressure which has so frequently been assumed. Physiological increase or decrease of volume is attended by insignificant or no changes in pressure—the balance is practically maintained. A marked increase of volume from pathological conditions often takes place without disturbing the balance; this varies in different subjects.

2. Hydrostatic pressure at any point within the abdomen varies with the position of the body and the depth of the superimposed organs.

3. Negative pressure at uppermost points is possible under certain conditions where the walls of such uppermost points are rigid. In the upper abdomen in the upright position a negative pressure may exist which has more or less to do with the support of the viscera.

4. Respiration causes small waves of pressure.

5. Coughing, sneezing, defecation, labor and many movements of the body cause a very marked increase of intraabdominal pressure by contraction of the muscles in the abdominal walls. Such pressure is transmitted in all directions and without diminution to every part of the contents and interior of the abdomen.

6. The facts as brought out in the paper should be applied to the problems of gynecology and obstetrics with greater accuracy than in the past.

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FOREIGN BODIES LEFT IN THE ABDOMINAL CAVITY AFTER OPERATION.

BY

PALMER FINDLEY.

Omaha, Nebraska.

IN former years, the abdominal surgeon was seriously disturbed by well-grounded fears of secondary hemorrhage and sepsis, but surgery has mastered these problems to a large degree and they are little feared and seldom experienced. Now it is the thoughts of the sponge that disturb the night's repose when the report comes that something has gone wrong with our patient.

As with the shade of Banquo, the subject will not down. No matter how confident the operator may feel in his safeguards, he can never rid himself of the feeling of uncertainty as to the possibility of leaving a sponge or an instrument in the abdominal cavity.

In reviewing the literature and in talking with surgeons one is impressed with the great diversity of precautionary measures, and yet it is doubtful if any are infallible.

It is usually in the difficult cases requiring a great number of sponges that the accident occurs, and it is in just such cases that any routine practice may miscarry.

In 1899, Neugebauer collected 108 cases of accidental leaving of foreign bodies in the abdominal cavity (*Zent. f. Gyn.*, 1904, No.

3, and *Monat. f. Geb.*, vol. xi, No. 4). He has since made additional reports; the last appearing in the *Archiv. für Gynäkologie*, 1907, Band lxxxii. The total number of cases reported by Neugebauer now number 236. He refers to the unfortunate consequences in case suit is brought. When the court absolves the surgeon from legal responsibility, there is yet the sacrifice in loss of time, loss of practice and moral depression.

Schauta says that every suit brought against a surgeon for the leaving of a foreign body in the abdomen is equivalent to conviction, because the surgeon is discredited in the eyes of the public.

The following case is in point:

Döllinger, of Budapest, removed a sarcomatous growth from the abdominal cavity. Fifty artery clamps were used in the operation, but these were not counted. The operation was hurried because of the depression of the patient. Patient remained in the hospital twenty-three weeks. Two years later she became pregnant and in the second month of her pregnancy an abscess developed in the scar of the abdominal incision. Shortly after the birth of the child, which was at full term, a fistula opened in the scar and in the fistula an artery forceps was found. She was taken to another hospital where the forceps was removed. Döllinger was held responsible in damages. The public press took up the cry, comic papers made capital of it and pamphlets on the case were sold at cigar-stands. This went on for a year. The court decided for the defense. Though acquitted before the law, the surgeon was convicted in the eyes of the public. Döllinger afterward stated that the case consumed all his time for thirteen months, during which time he was so disturbed in mind that he was wholly unfit to do scientific work. Some of his critical colleagues worked to his detriment and the harm done by the public press was irreparable.

Döllinger asks: "What can we do to protect ourselves against such blackmail?" In the absence of international jurisdiction, it is impossible to come to mutual agreement. It is not the verdict that we are so much afraid of as the abuse of press liberty and sensational reports.

For the purpose of emphasizing the possible occurrence of this accident in the hands of the most skilled of surgeons, of showing how the accident may occur, and what the penalty to patient and surgeon, the following cases are briefly recited. These records are taken from already reported cases. Some of them have been given me by my colleagues for the purpose of making this report.

Amann, of München, proceeded to operate on a case for a fibroid of the uterus that had been operated on in America eighteen months previously. The fibroid proved to be a pear-shaped mass on the fundus of the uterus composed of an inflammatory exudate surrounding a gauze sponge. Recovery followed its removal.

Van Marter and Carson reported in the *AMER. JOUR. OBST.*, 1904, two full-term ectopic pregnancies, in one of which a gauze tampon was expelled through the rectum seventy-five days after the operation. The gauze measured thirty-six by eighteen inches. There was no temperature in this case, but the pulse was rapid and the patient complained of abdominal pains and constipation. After the expulsion of the gauze recovery was rapid.

Eckstein performed a laparotomy for the removal of an ovarian cyst. A stitch infection appeared on the ninth day. This cleared up promptly and the patient was apparently well for one year, at which time she complained of pain at a point one inch above and to the right of the umbilicus. Three months later a fistula opened at this point and through the opening a small strip of gauze was removed. Recovery was speedy. The count of the sponges was correct, but the lost strip was loose in the folds of a gauze pad.

Allison, an English surgeon, reported a case in the *Lancet* of February 16, 1901, in which a man of forty-nine years had been operated eight and one-half years previously for an internal incarceration. He found a metallic foreign body protruding through the abdominal wall on the right side and immediately above Poupart's ligament. It was recognized as an artery clamp. The man refused an incision and the surgeon removed only the point of the instrument. Later the patient returned with half the forceps which found its way out, but at the time of making the report he was still carrying the remainder of the forceps in his abdominal cavity.

Gruzdew (*Zent. f. Gyn.*, 1906, No. 46) recorded the case of a woman of fifty-eight years who presented herself in his clinic with a foreign metallic body protruding through the abdominal wall. On vaginal examination, the handle of the instrument was felt in the cul-de-sac of Douglas and was removed per vaginam. Recovery was rapid. The instrument was a clamp 20 cm. in length and was partially covered with white connective tissue.

Hedlund (*Hygiea*, 1904, No. 9) removed a Peán forceps from the abdomen of a patient who had been operated six years before for

a myomatous uterus. She was apparently well two years after the original operation. Then followed disturbances of the stomach for four years. Illness developed six years after the initial operation, when Hedlund removed a Peán forceps that had perforated the small gut and was buried in adhesions. The patient died in forty-eight hours from uremia. The autopsy revealed a contracted kidney, but no peritonitis.

Janczinski, after ten years of careful work in abdominal surgery, removed a pyosalpinx and ovarian cyst. It was a difficult operation because of adhesions. Both vaginal and abdominal drainage was established. A pad of gauze placed over the viscera while sewing the peritoneal incision was forgotten. Convalescence to the fourteenth day was normal and the stitches were removed; the patient left her bed. On the twenty-first day, the wound opened and the gauze pad which had remained sterile presented at the opening. After its removal the wound closed promptly.

Küster, of Breslau, removed a cystic tumor of the pancreas. It was a difficult, bloody operation. The basal part of the cyst was stitched into the abdominal incision. Convalescence was slow. Six weeks after the operation, a tender spot appeared at the upper end of the incision. This was incised and a small forceps removed. Recovery followed, though slowly.

Poten, of Hanover, removed a large adherent ovarian cyst. Large areas of peritoneum were stripped from the abdominal wall in the removal of the cyst. Bleeding from the raw surfaces was controlled by a long strip of gauze; this was forgotten. A stitch abscess developed and in this abscess the end of the gauze roller presented. Removal of the gauze was followed by a speedy convalescence.

H. Riese (*Archiv. f. klin. Chir.*, vol. lxxiii) lost gauze compresses in two cases out of a total of 900 laparotomies. The first was an intraperitoneal nephrectomy. For several days there was evidence of peritoneal involvement, then convalescence progressed satisfactorily for a month. At the end of this time pain and fecal vomiting set in and a tumor the size of a man's fist was located to the left of the umbilicus. An incision was made over the tumor and there was removed a gauze strip one metre long. Recovery followed.

The second case of Riese was a tubal pregnancy, a difficult operation. Convalescence was uneventful. Three years and ten months later the patient returned to the hospital complaining

of abdominal tenderness, constipation and a sensation as of a foreign body in the abdomen. At the left of the uterus was found an ovarian cyst and above this was a cyst the size of a billiard ball, the contents of which was a sterile gauze sponge.

Riese recalled another case where the woman, after an abdominal operation, pulled from her mouth a piece of gauze and claimed that it had been left in the abdomen by the operator. Suit for damages was brought. Riese was called before the state's attorney for explanation. The impossibility of such an occurrence was impressed upon the state's attorney and the case was dropped.

J. Veit reported a case to the Berlin Obstetric Society in which a vaginal hysterectomy was performed and a rubber tube was left for drainage. The tube was forgotten and four and one-half months later was passed by the bowel.

A similar case was also reported by Veit in which a rubber tube was passed through the bladder and urethra. (*Zeitsch. f. Geb. u. Gyn.*, Bd. xii).

Winter (*Zeitsch. f. Geb. u. Gyn.*, Bd. li, H. 1, 1904, S. 170) removed a myomatous uterus. It was a difficult operation. There was considerable hemorrhage, and compresses were used to control the oozing of blood. Three weeks later death occurred from an embolus emanating from a thrombus in the iliac vein. Over this vein was a foul-smelling compress.

Waldo, of New York, reported a case in which a strip of iodoform gauze remained two years in the abdominal cavity. It was removed and recovery followed.

Stewart Ferguson (*Australian Med. Gaz.*, Sept., 1906) reported a case in which an ovariectomy was performed, and ten and one-half years later a forceps was found in the left iliac fossa which had caused local pain and bladder disturbances. It had ulcerated into the bowel. The forceps was removed and intestinal anastomosis performed and recovery followed.

Le Gende (*Gaz. des Hosp.*, May 13, 1906) reported a case in which a forceps was left in the abdominal cavity during a period of six years when death occurred. The autopsy revealed the forceps, which had caused an abscess formation and necrosis of the bowel.

In the *Russian J. of Obst. and Gyn.*, March-April, 1906, is recorded a case in which an artery forceps was left in the abdominal cavity. Necrosis of the bowel occurred, requiring resection of the bowel. Recovery.

Essen-Moeller reported the case of a woman, sixty-six years of age, from whom a cancerous ovary was removed. An artery clamp was left on a bleeding vessel, coils of bowel covered it and it was forgotten. Death followed symptoms of ileus. In the postmortem examination the forceps were found to have perforated the bowel.

Sippel, of Frankfurt, removed a broad ligament tumor. A gauze compress was used to control the hemorrhage. An abdominal drainage of iodoform gauze was used and removed on the following day. Six weeks later the forgotten compress was discharged through the bowel.

Th. Landau operated a case of extrauterine pregnancy (*Berlin. klin. Woch.*, No. 32, 1906). Six years before, this patient was operated for an ovarian tumor and eighteen weeks subsequent to this operation a towel was removed from the abdomen.

W. Stoeckel (*Zent. f. Gyn.*, No. 1, S. 1-5, 1907) reported a case in which a gauze sponge was left in the urinary bladder. The bladder had been injured accidentally in an abdominal operation and this sponge had been placed in the wound. Bladder tenesmus and turbid urine called for a cystoscopic examination, and in this manner the gauze was located.

MacLaren, of St. Paul, in writing of "Personal Surgical Errors" (*J. A. M. A.*, vol. xlix, No. 3) reported four cases:

CASE I.—Ovariectomy and ventrosuspension. Gauze sponge left in peritoneal cavity; expelled by the rectum ten days later; recovery. The sponge occasioned obstinate constipation, pain and a temperature reaching 101° F., until the sponge was expelled through the bowel.

CASE II.—Hysterectomy. Immediate recovery; later persistent pain and tenderness in pelvis, with formation of tumor in right loin at end of two years. Abdomen opened and artery forceps found imbedded in adhesions, omentum and ulcerated bowel. The point of the forceps lay within the appendix, the handle in the lumen of the cecum, the middle of the shank transfixed a coil of the ileum. The cecum was opened to remove the forceps, the adherent coils of bowel were separated and the openings into the bowel were closed with catgut. Recovery was perfect.

CASE III.—Vaginal section for pelvic suppuration. Gauze strip left in wound. Strips of iodoform gauze were used to control hemorrhage from the vaginal walls. Because of secondary hemorrhage, the case required two subsequent packings. After

returning home an odorous discharge from the vagina incited the patient to make a digital examination. Her search was rewarded by the finding of a strip of iodoform gauze, for which she was rewarded handsomely by the operator, though admitting that it was not his fault.

CASE IV.—Hysterectomy. Tape sponge left in the abdomen. The operation was bloody. The count of the sponges and instruments was reported correct. At the postmortem examination on the fourth day, following the operation a tape sponge, twelve inches square, was found rolled into a ball under the liver. No other cause of death was discovered.

MacLaren speaks of having witnessed two postmortem examinations when an interne in a New York hospital, where the leaving of sea sponges caused general suppurative peritonitis. He observes that in these later days when gauze sponges have replaced sea sponges the mortality of these cases is much lessened. He has knowledge of ten cases where sea sponges were left in the abdominal cavity, and in nine of this number death ensued from general suppurative peritonitis; in the tenth case there was a localized abscess formation.

It is of interest to note the various safeguards adopted by surgeons. Colmann recommends that the compresses have a tape attached to the free end that is long enough to tie to the leg of the operating-table and after using they are to be dropped to the floor.

Fisher, in the *Annals of Surgery*, 1908, proposes a linen tape, three to four feet in length, armed at one end with a needle by which the compresses are transfixed on the tape. A piece of lead weighing a half-pound is attached to each pad to prevent the pads from being lost in the coils of bowel.

Gruzdew, at the completion of the operation, irrigates the abdominal cavity with sterile normal salt solution and then passes his hand over all parts of the viscera in search for sponges and instruments.

Fritsch sews on each compress a long black thread which hangs out of the wound and over the side of the operating-table.

Kruitchmann marks his sponges in Roman and Arabic numerals and in letters as follows: I, II, III, IV; 1, 2, 3, 4; a, b, c, d. After using, the sponges are placed on the floor by a nurse in the order as marked.

Mikulicz attached a long thread to each compress and on the end of the thread he strings a glass ball which hangs over the side of the operating-table.

Rossel attaches to each compress a tape 20 cm. long at the end of which is a sinker weighing three grams.

My own method is as follows:

Three sizes of gauze sponges and compresses are used; a roll five yards long and four inches wide and six plies in thickness; second, a compress one yard long, eight inches wide and three plies in thickness; third, tufts of gauze so folded as to infold all edges to prevent loose threads or layers of gauze from rubbing off on the viscera. To the free ends of the rolls and compresses is sewed a tape twelve inches in length and to this tape is attached an artery clamp. From the time the abdomen is opened to its closure no sponge is handed the operator or assistant without a sponge holder in the form of a long clamp.

Before sterilizing the rolls, compresses and sponges, they are counted three times by two nurses, then wrapped in towels and the number marked with indelible ink on the wrapper.

Before these sponges are removed from their wrappers all loose sponges about the operating-room are removed. The sponges and compresses to be used in the operation are then counted by the clean nurse and the assistant. This count is made separately to avoid the possibility of error, and the number is then placed on a slate. If additional sponges are required in the course of the operation they are to be counted and added to the number on the slate.

The soiled sponges and compresses are thrown into a receptacle from which they are taken by the nurse in attendance and arranged in parallel rows on the floor in order that the count may be facilitated at the close of the operation. While closing the peritoneum, the assistant and clean nurse count the sponges and compresses, and if the number corresponds with that on the slate the wound is closed; if not, search must be made for the missing sponge. The clamps, forceps and scissors are also counted prior to the opening of the abdomen and before the incision is closed.

Observance of these rules has twice saved me from the loss of a sponge in the abdominal cavity. In both these cases the count showed one sponge missing after the peritoneum was all but closed. The stitches were removed and the sponge found in the pelvis. In another instance it did not save me from the grievous error. In the course of the operation I cut a roller in two and called the attention of the assistant and nurse to the fact. At the close of the operation they reported all sponges and compresses accounted for and the abdomen was closed. Ten days later I cut

down upon a swelling in the left lumbar region and removed a strip of gauze five feet in length. Convalescence was satisfactory after the removal of the gauze. It is needless to remark that thereafter I have cut no more compresses.

The following reports of cases which have been settled in court will be of interest in showing the temper of the court in these cases.

Dr. Mary Thorne, of England, was sued for leaving a sponge in the abdomen. She was fined twenty-five pounds. The defense claimed that the responsibility rested with the nurse whose duty it was to keep track of the sponges, claiming it to be the sole duty of the surgeon to devote her attention to the patient. The justice recognized the skill of the surgeon, but the question under consideration had reference to the want of due and reasonable care and superintendency in the counting of the sponges. The second question involved was; Was Mrs. Palmer, the nurse, employed by the defendant to act as an assistant in the operation? Third, Was the nurse guilty of negligence in counting the sponges? Fourth, Was the counting of the sponges a vital part of the operation which the defendant undertook to see properly performed? Fifth, Was the nurse under the control of the defendant during the operation?

The jury answered all these questions in the affirmative. The damages were assessed at one farthing. The justice returned the jury and a second judgment was rendered for twenty-five pounds.

Prof. Fiori Foa, of Turin, operated a case for gall-stones. The wound was left open and packed with gauze. The next day part of the gauze was removed by the operator and the case was then placed in charge of the interne. Patient improved, but an unfavorable prognosis was given. Later he was removed from the hospital. Soon pain, dyspnea and temperature set in. The wound closed, leaving two fistulae, through which a strip of gauze was detected by a second physician. The patient died. At the postmortem examination two litres of pus were found in the abdominal cavity, together with a gauze pad 70 x 40 cm. The report of the pathologist was: "General suppurative peritonitis and pleurisy due to the presence of gauze left in the abdominal cavity. Suit followed.

First suit decided that the patient would have died from other causes than the presence of gauze in the abdomen. The prosecution claimed that the records of the hospital were falsified,

hence a second trial was granted. In the second suit ten experts testified that the gauze was the exciting cause of the death. The suit was withdrawn for lack of proof. Pior Foa concludes that the Italian government should submit such cases to technical men rather than to quacks, and blames the pathologist for his examination and report.

The question may arise, How can we prevent litigation in such cases? Unquestionably, the prophylactic measure of exercising every possible precaution is of the greatest value. For the operator to demand a release on the part of the patient before operating is a confession of weakness and has no practical value.

Kossmann advocates starting a counter suit for libel in the expectation that the prosecution will retract. Such protection as is afforded by the ¹Physician's Defense Company will prove the greatest service to the surgeon, not so much in defense in court as in preventing these cases from coming to suit.

Richardson says he has on several occasions found foreign bodies in the abdomen left there by other surgeons, but in no instance has the occurrence been made known to the detriment of the operator.

It is to be hoped that all surgeons will be equally charitable, if for no other reason than that we are all liable to become the victims of this grievous error.

3602 LINCOLN BOULEVARD.

THE EXTERNAL ANTEPARTUM EXAMINATION.

BY

W. W. REED, M. D.,

Boulder, Colo.

Instructor in Obstetrics, University of Colorado.

THE facts to be determined by a complete antepartum external examination are many, some of them of extreme importance, and all worthy of some attention. Every physician recognizes the importance of frequent urinary examinations in the latter months of pregnancy, but not all so fully recognize the value of the antepartum examination. Among the important points that may be determined by the examination are the existence of pregnancy, the period of gestation, the attitude, presentation, and position of the fetus, the situation of the placenta, the presence of multiple pregnancy, the condition of the uterine and abdominal muscles, the relative size of the fetus and mother, estimation of

the size and shape of the pelvis by pelvic measurements, etc. The complete examination is not lengthy, consuming from one-half to three-quarters of an hour, and need not put the patient to serious inconvenience. It should be made not later than the eighth month to be of the widest use.

We are prone, despite the fact of definite knowledge of method and technic, to take the chances of the case being normal as it so often is. We too often rely upon the rarity of complications to protect our patients, rather than upon accurate and painstaking diagnosis.

Without entering into a systematic discussion of the details of a complete antepartum examination, I wish to emphasize some of the points of value in connection with the use of the abdominal examination and to offer as strong a plea as possible, for its more frequent practice. Although every text-book of obstetrics devotes considerable space to this subject and every student is drilled in the technic of abdominal palpation and pelvimetry, external antepartum examinations are usually not made and pelvimetry is not practised. It is strange that abdominal palpation has not been, and is not now, more generally used, as by it, in nine cases out of ten, it is possible to determine long before labor has begun, the presentation and position of the fetus in utero. Surgeons and gynecologists become expert in the diagnosis of tumors by abdominal palpation and bimanual manipulation; the internist uses inspection, palpation, percussion and auscultation in intrathoracic and intraabdominal diagnosis, with much success, so why should not the obstetrician become equally expert in determining the position of the fetus in utero by these same methods? In order to obtain the best results from the examination it must be made systematically, following a definite plan of procedure, as is done, for instance, in a physical examination of the chest.

The patient should occupy the dorsal position upon the side of the bed or a table, with the abdomen bared and abdominal muscles well relaxed. The examiner stands at the patient's right, facing her feet during the first part of the examination, but reverses his position and faces her head for the last part. While palpation is the most important part of the abdominal examination, inspection and auscultation are also used to advantage. By inspection, one notes the size, contour, and position of the uterus, and may observe fetal movements. By palpation one endeavors to detect the movements, and to locate the head, back,

breech, shoulder, extremities, etc. By auscultation, the position and greatest intensity of the fetal heart sounds are located.

In carrying out our scheme of examination it is convenient first, to know the direction of the long diameter of the uterus. To determine this, the examiner lays his hands along the flanks of the patient, bringing the uterine ovoid between them. If the greatest diameter lies parallel with the mother, the uterine ovoid is longitudinal and the child lies in either head or breech presentation; but if the longest diameter is transverse, then a transverse presentation of the fetus very probably exists.

The next point is to find out what is over the inlet. With the tips of the first three fingers of each hand placed parallel with Poupart's ligament, deep pressure is made downward in the direction of the inlet and at the same time the fingers are approximated, when it is usually possible to catch the fetal pole there and to manipulate it. When the pole is reached the point to determine is whether or not it is the head or breech. If the head presents, it will be felt as a hard, round, resisting body of greater prominence on one side, and as may be later determined, on the same side as the small parts. In palpating the head, considerable care should be taken to note on which side the head is most prominently felt, and the extent of the prominence. In a well-flexed head, the frontal eminence is much the more easily reached and in vertex presentations this eminence is found on the same side as the extremities. In face presentations the prominence is greater on the same side as the back. If but little difference on either side can be noticed, it means a partially extended head with a possible brow presentation. In occiput-posterior positions, after engagement has occurred, the results will be negative so far as distinguishing the prominence is concerned.

Again the degree of ease with which the head is palpated indicates the extent to which descent into the pelvis has occurred. The head is also, it should be remembered, the only part that descends or can be made by pressure to descend into the pelvis before labor. The breech always lies above the inlet until labor begins. If either pole is found to occupy the iliac fossa with a longer transverse diameter of the uterine ovoid, etc., the presentation is probably a shoulder.

Having determined the part over the inlet, the examiner faces about, and reverses the position of his hands. With the tips of the two hands, as before, the fundus is gently palpated and the fetal pole occupying it is differentiated. The breech gives the

feel of a large irregularly shaped nodular body less movable and softer than the head. The head gives the characteristics described—a hard round body, freely movable, easily palpable and subject to ballottement. Fetal movements may be felt. Knowing the part that is over the inlet and the part occupying the fundus, it is next essential to know on which side the fetal back lies and where the extremities are. To determine these points, the examiner places the palmar surface of one hand on either side of the abdomen and makes firm but gentle pressure, bringing the uterus and contents directly between his hands. On one side he recognizes a smooth resistant surface convex from end to end—the fetal back. It should be noted also whether its direction is anterior, transverse or posterior, thus getting some light upon the variety of the presentation. On the other side is recognized the cystic portion of the uterus in which are felt numerous irregularities, the small parts. The general contour of this side is concave with a deep sulcus.

The finer points of the examination may or may not be worked out, namely, the location of the anterior shoulder, the differentiation of legs, arms, etc., but this, while desirable, is not essential to a correct diagnosis of the presentation and position.

It is advisable always before terminating palpation to make a special point of determining, as nearly as may be, the relative size of the presenting part to the pelvis. Neither the absolute size of the presenting part, nor the absolute size of the mother's pelvis, can yet be determined, but by palpation we can be fairly certain that no excessive disproportion exists and that we are not dealing with hydrocephalic or other monster. In determining these points the presenting part should be adjusted and fitted into the pelvic brim by pressure and manipulation, as in palpating to discover the part lying over the inlet. By firm but gentle pressure downward upon the fundus, with the left hand, and by grasping the presenting part between the thumb and fingers of the right hand and making pressure, and at the same time carrying the head downward and backward in the direction of the axis of the inlet, the presenting head will be found to fit accurately into the brim, and upon pressure gradually to enter more or less into the inlet without pain or discomfort to the patient, if all is well and no disproportion exists. In cases of marked disproportion the head cannot be fitted into the inlet, and remains, in spite of all manipulation, unmistakably above the brim. In very timid or nervous patients, when

a pelvic contraction or other marked disproportion is suspected, and this procedure cannot be satisfactorily carried out, it is certainly of sufficient import to justify giving an anesthetic and thus thoroughly to ascertain the extent of the disproportion.

Many crude forms and methods of abdominal palpation have been practised as an effort to determine the position of the fetus in utero since very remote times, but until comparatively recently it has not attracted due notice. Credé and Leopold have done good work in systematizing the external method of examination and in pointing out its practical value and advantages over the internal or vaginal examination. There is little doubt that abdominal palpation, when properly executed, constitutes one of the most important advances in obstetrical diagnosis.

Auscultation, as an integral part of the external examination, should never be omitted. It ranks next in importance to palpation and while not of such great value in diagnosis, if taken alone, it is very satisfactory in confirming the findings of palpation. By far the most important sound heard is the fetal heart beat, though the funic souffle and uterine souffle, or so-called placental souffle, can also be distinguished. The fetal heart sounds can be heard first at about the sixth month and gradually increase in intensity. The rate, however, increases but little, varying from 120 to 150 beats per minute. The greatest value in connection with the fetal heart sounds, from a diagnostic standpoint, is in the location on the woman's abdomen, of the point where the sounds are heard with the greatest intensity, as this helps to determine the diagnosis of the presentation and position. For example, in an L. O. A. position, the point of maximum intensity is midway between the umbilicus and the left anterior superior spine, in R. O. A., midway upon this line on the right side. In R. O. P. the sound is best heard in the woman's right flank, while in L. O. P. it is heard in the left flank. In breech presentations it is loudest just above the umbilicus, a little to the left or right of the median line, depending upon the position of the fetal sacrum, etc. In other words, the fetal heart sounds are best transmitted through the convex portion of the body of the fetus that lies in most intimate contact with the uterine wall, which is the back in vertex and breech presentations, and the thorax in face and occiput posterior cases, and hence is best heard at the points mentioned above. In auscultating for the fetal heart sounds it is always well, by careful manipulation, to bring the back or thorax in as intimate contact with the uterine wall under

the stethoscope as possible, displacing the liquor amnii there, and thus intensifying the sounds.

The old method of conducting a case of labor entirely by vaginal examination, attempting thereby to determine the position by the sutures and fontanelles, is to me very unsatisfactory. Of course, it is not impossible for anyone to mistake the fontanelles or sutures under some conditions; occasionally the face is not differentiated from a breech by vaginal examination alone. In difficult labors the caput succedaneum is often so extensive as to obscure everything and all the diagnostic points become obliterated.

One of the greatest arguments to my mind in favor of the abdominal examination, and one certainly of great value to the patient, is that it does away with frequent vaginal examinations and thus greatly minimizes the danger of infection. We all fully appreciate that this is a danger in general practice of no little moment. Notwithstanding our elaborate and painstaking care in mechanical and chemical cleansing, absolute hand disinfection cannot yet be accomplished. By the skillful use of abdominal palpation in a normal case it is possible to conduct the labor understandingly with very few, perhaps two, vaginal examinations. Indeed, Williams says that in his private work he conducts more than 50 per cent. of his cases by abdominal palpation alone and that vaginal examination is absolutely unnecessary to him except in the few cases in which palpation does not give satisfactory results, or in those presenting some abnormality, or in which the course of the labor is unduly prolonged. From my own limited experience in the use of the abdominal examination, I am fully convinced that it far exceeds the internal in usefulness and yields much more information of practical importance. I am further convinced that when we give as much attention to it as to becoming proficient in physical diagnosis of the chest, for instance, the infant mortality at birth will be greatly reduced and much harm that now results from the too frequent use of forceps regardless of position or possible injury to the fetal head or maternal soft parts, may be avoided.

We frequently point with pride to the accomplishments of modern medicine and especially of preventive medicine, but we must step aside at the humiliating facts of the mortality statistics of child-birth. Our means of gathering these statistics, it is true, are very imperfect, the "reports" simply stating "born dead," "still-born," etc., and not specifying whether the

death was due to the act of parturition, natural or artificial, whether it occurred in utero or soon after parturition. Regarding certain points, however, they are quite conclusive. It is known that of every million children born, 72,000 die at or immediately after birth and are recorded as still-born. In face presentations the fetal mortality runs from 12 to 16 per cent. and in persistent mento-posterior positions it is practically 100 per cent., brow 12 per cent., breech 25.5 per cent. to 37 per cent., shoulder 50 per cent. occiput posterior 10 per cent. for child and 3 per cent. for mother; placenta prævia 66 per cent. for child, 40 per cent. for mother; puerperal eclampsia 33 per cent. for child, 25 per cent. for mother, etc.

To what extent this frightful loss of infant life is capable of reduction, is, of course, a mere matter of surmise. That a better understanding of the case in hand, as may be had by an early abdominal examination, might lead to early correction and better management of the malpositions and malpresentations and thereby improve the general results, it is fair to presume. Just as the practice of greater watchfulness and careful prophylactic treatment during pregnancy has greatly reduced the percentage of cases of puerperal convulsions, so may a better and an earlier knowledge of possible causes of dystocia bring about a great reduction of the percentage of mortality therefrom.

SOME INTERESTING CASES.*

BY

THOMAS C. SMITH, M. D.,

Washington, D. C.

SOME cases met with in the practice of medicine are amusing, some interesting, some instructive. Those which I shall relate have impressed me variously and may prove interesting to others.

INTRAUTERINE AMPUTATION OF THE FOREARM.

In this case, when the child was born it was seen that the forearm from less than an inch below the elbow was missing. The end of the stump was perfectly smooth. When I informed the mother of the nature of the deformity she wanted to know if the fact that she wore a number of bracelets during gestation had anything to do with the loss of the limb.

* Read before the Washington Obstetrical and Gynecological Society, Feb. 21, 1908.

UTERUS BILOCULARIS UNICOLLIS.

Having occasion to make a vaginal examination in a young unmarried woman, the existing condition was of sufficient interest to justify the use of the speculum. The cervix was of normal size, but in it were two openings, one about three-fourths of an inch behind the other. I passed a sound into each opening and the two met about one inch from the orifice. No further instrumentation was deemed justifiable, but a bimanual examination indicated a uterus of normal size. The interest in the case attaches to the unusual relation in position of the two openings, the ordinary situation of the openings being side by side. The small size of the cervix is also worth noting. In case of pregnancy supervening the proper procedure at the time of labor would be to make one track of the two.

PREGNANCY THROUGH A PIN-HOLE HYMEN, WITH UNUSUAL ATTACHMENTS OF THAT MEMBRANE.

An unmarried colored woman called at my office and told me she had an enlargement in the abdomen and desired to learn its nature. She was very tall—six feet—very black and very respectable. I placed my hand on the abdomen and a fetus responded with a vigorous kick. There was decided contraction of the uterus at short intervals and that with the complaint of pain indicated that the woman was really in labor. Examination revealed a short vagina, the hymen having been pushed up, and in the center was a very small opening into which my finger tip would not enter without the use of considerable force which I did not desire to exert at the time. The woman was informed of her condition. She said that could not be as she had been unwell regularly. A few hours later I was sent for and found her having strong pains. There had been no dilatation. I forced my finger through the small opening referred to and it entered the cervix into which the head of the fetus was entering. The hymen was found to be attached to the cervix. I managed to separate this at one point and then tore my way to the sides of the cervix where the hymen was quite strongly adherent as it was to the sides of the vagina. The cervix now rapidly dilated and in a short time a six-months fetus was extruded. There was nothing unusual in the after-history of the case.

The point of interest in this case was the unusual adherence of the hymen to the cervix uteri and vagina.

TRANSVERSE LACERATION OF THE CERVIX UTERI DURING LABOR.

In the *Journal of the American Medical Association* for November 10, 1888, page 665, I reported a case of transverse laceration of the cervix uteri occurring in the person of a colored primipara, twenty-three years of age. She had suffered the escape of the amniotic fluid two days before. On examination a transverse laceration involving about one-third the circumference of the cervix was found situated posteriorly and to the left. The os uteri was not at all dilated. The tissue intervening between the two openings was divided with a bistoury and the labor terminated very soon. A few years ago the following case occurred:

The patient was a primipara, only sixteen years old. On being called to the case and making the usual examination it was found that labor had progressed until the os was dilated to the size of a silver quarter-dollar. One hour later, the pains had become quite severe and on introducing my finger the os had dilated to the size of a silver dollar. Anteriorly and to the right a laceration was discovered involving more than one-third of the circumference of the cervix, the position of the vertex being right occipito-posterior. Being interested in the subject, I invited a neighboring physician to examine the case. With some difficulty I divided the parts, as in the former case, and after administering an anesthetic the labor was terminated by forceps. It was not deemed proper to make an effort to change the position of the head because of the risk of extending the tear to the body of the uterus. A few months after the delivery an examination was made and it was almost impossible to locate the point of laceration where the cervix had been divided by the knife. Nine days ago I was called to attend this lady in her second labor which terminated in two hours without any complications.

Attempts to explain the cause of this form of cervical laceration have not been satisfactory. Some claim that a severe character of pains attended by a rigid os in aged primiparæ conduces to the laceration, but both of my patients were young.

COMPLETE INVERSION OF THE UTERUS.

Late at night Dr. Warwick Evans requested me to see a patient with him. The lady was a primipara and had been in labor all day. The head was low in the pelvis and had made no progress

during several hours. The os was completely dilated. A small quantity of chloroform was administered and the child delivered without difficulty. Dr. Evans placed his hand over the uterus to insure contraction, but no pressure was made as the uterus seemed firm. The doctor was very tired and I relieved him. On placing my hand above the pubis I failed to find the usual large uterine tremor, and on taking hold of the cord I found the placenta at the vulva and ready to be extruded. On making very slight traction on the placenta it came away with some force. When I started to lift it away its unusual size caused me to make an investigation and a complete inversion of the uterus with the placenta attached was found to be present. Informing Dr. Evans of the nature of the case and his examination confirming my statement, I promptly separated the placenta and in a few minutes succeeding in replacing the organ. The splendid picture in Williams's "Obstetrics" so perfectly portrays the inversion as it appeared in my case that no further description is necessary.

Inversion of the uterus at the time of labor occurs very seldom, once in about 200,000 cases. This is the only case which has come under my observation.

While the cause of inversion is usually the resort to violence, especially on the part of midwives, it must be conceded that other factors cannot be eliminated. Williams says: "For the production of the accident two factors are necessary: marked laxity of the uterine walls, particularly at the placental site, and a patulous cervical canal. Inversion may occur spontaneously as the result of the intraabdominal pressure or from the mere weight of the intestines, while in other cases it is attributable to violence resulting from the too vigorous employment of Crede's manuever or to traction upon the cord." Relaxed condition of the uterine walls is not, in my opinion, a necessary factor in the production of inversion of the uterus, but a similar condition of the cervix is. In the case reported the explanation is that the long-continued dilatation of the cervix by the child's head and the contraction of the uterus needed only the weight of the placenta attached to the fundus to produce the inversion. As stated above, there had been no traction on the cord and no pressure over the fundus.

The propriety of returning the uterus before detaching the placenta has been questioned, but I can see no good reason to return the placenta only to take it out again. Surely one can

remove the attached placenta when the eye assists the hand with more facility than when the hand has to act "in the dark."

CALCAREOUS DEPOSITS IN THE PLACENTA.

For several years the frequency of the occurrence of calcareous matter in the placenta has attracted my attention and I only mention the subject to learn if others have met with cases more frequently than in former years. In some of my cases calcareous plates as large as a silver quarter-dollar have been present, while in others the particles of lime have been so freely distributed through the placenta as to convey to the hand such an impression as would be made by grasping a bag containing small gravel. I am not aware that any special significance attaches to the condition. The large number of cases in which the deposits were present has been interesting to me.

1133 TWELFTH ST., N. W.

OBSTETRICAL DRAWERS.

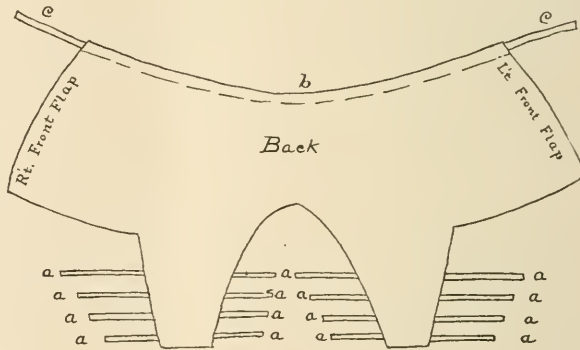
BY

JENNIE G. DRENNAN, M. D., C. M.,

St. Thomas, Ontario.

(With one illustration.)

THE cut below represents a pair of obstetrical drawers, cut in one piece for protecting the abdomen and limbs of the patient from exposure during delivery. Towels are prone to fall out of place and sheets are awkward to properly adjust, especially when the patient is moved as is frequently necessary in difficult labors. They may be made of heavy muslin, linen or canton



flannel. The drawers are sterilized with the night dress and stockings. They extend to the ankle and are tied by tapes on the inner side of the leg. A casing passes around the top through which a tape is run, which is tied around the waist. The broad flaps may be pinned or left loose. The whole is easily removed by untying the tapes.

For valuable assistance in cutting out the pattern I am deeply indebted to the head nurse of the hospital, Miss Margret McLellan.

AMASA WOOD HOSPITAL.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

(Continued.)

DR. AUGUST MARTIN, of Greifswald, Germany, read a paper (by invitation) entitled,

THE DEVELOPMENT OF THE TECHNIC OF GYNECOLOGICAL OPERATIONS.*

DR. F. PFANNENSTIEL, of Kiel, Germany (by invitation) followed with a paper entitled,

ABDOMINAL AND VAGINAL CELIOTOMY; A COMPARATIVE STUDY OF THE VALUE AND EFFECTIVENESS OF BOTH OPERATIONS, WITH NOTES ON THEIR INDICATIONS AND TECHNIC.

The author stated that both methods, abdominal and vaginal celiotomy, were so far developed that, from a purely technical point of view, it was actually possible to carry out all gynecological operations on intraperitoneal organs in both ways. In the choice of an operative method, the operator should prefer that method which offered the best chances both primarily and secondarily for the life and health of the patient. Abdominal celiotomy possessed very important advantages. The possibility of making the opening in the abdominal wall just as large as we chose gave us the advantage of the largest possible view over the field of operation. The operation could be performed with great care. We could apply with equal surety the principle of conservatism or of radicalism according to the needs of the case. The operation could be extended to neighboring organs and also to other organs situated higher up without any difficulties of approach. It enabled one to provide the intraperitoneal wound surfaces with peritoneum in a careful way in order to prevent disturbing adhesions and postoperative ileus. The disadvantages and dangers of abdominal celiotomy pointed out in former days had lost some of their importance through the improvement of asepsis and technic, and to-day we were able with the greatest certainty to avoid postoperative hernia, as well as to prevent the occurrence of peritonitis, provided we had to work on an aseptic subject. Abdominal celiotomy, therefore, was the established method of treatment for all aseptically pure cases of neoplasms, of extra-uterine pregnancy, chronic pelvic peritonitis, etc. When the object of the operation was not aseptic, the vaginal method

* See page 193.

might be the better, but one should first make sure that the infectious matter was completely removed.

Colpoceliotomy had, generally speaking, the advantage that the operation was borne better, but this difference was to be seen only when one had to operate on a nonaseptic organ, as, for instance, a carcinomatous uterus. Vaginal fixation of the uterus or vaginal ovariectomy was no better than ventro-fixation or ventro-ovariectomy, both with regard to the mortality and to convalescence after the operation. The second so-called advantage of colpoceliotomy was that usually it left behind no visible scar. But with our modern technic and careful sewing we could shape also the abdominal scar very thin and fine. It could even be rendered almost invisible. Sometimes the vaginal scar was invisible, but yet very troublesome and continually painful, not only the scar in the vaginal fornix, but more especially the scar through the vagina and the perineum, which followed after difficult operations requiring a large incision. The author had seen very ugly scars which were especially irksome to patients in sitting and walking. On the other hand, colpoceliotomy had the great disadvantage of the very small opening with all its consequences. At the time when vaginal operations were being worked out, this small opening caused a great deal of harm, and even claimed many victims through insufficient control of hemorrhage, through injury of the bladder, ureters and rectum, and through mistakes in the asepsis. Now, when the indication for this operation was more limited, things were better, but the nuisance of the small opening was always making itself felt anew, especially since surgeons knew the inner relation between the vermiform appendix and the inner genitals, and had recognized the need of enlarging the radical operation for carcinoma. For this reason the vaginal operation was not suitable for carcinoma of the inner genitals. We should utilize our experience with the vaginal extirpation of certain kinds of carcinoma, and we should learn to select such cases and reserve them for vaginal extirpation which had a lower primary mortality. There were certain forms of carcinoma of the portio and corpus which only made their appearance at a later age, and which were hard, rich in tissue and poor in cells. In the portio-vaginalis type of carcinoma we were especially concerned with that which began at the external os proper. All those forms which grew slowly and showed little inclination to infection of the glands could be handled by the vaginal method. All others, especially all cases of carcinoma of the cervix, should be dealt with as radically as possible through the abdomen in the same way as primary carcinoma of the vagina.

Of the benign neoplasms of the inner genitals, the myomata, if they exceeded a certain size, were best dealt with abdominally. Myomata larger than the size of a child's head were more easily dealt with abdominally; but with the smaller tumors the author preferred abdominal celiotomy, if the introitus and the vagina

were narrow, virginal and inelastic because the incision through the abdominal wall seemed to the author to permit the removal of the tumor with less traumatism than the auxillary paravaginal incision. There was only one indication which he acknowledged for vaginal extirpation, and that was the operation in the case of an infection of a myomatous uterus. In such cases, provided the vaginal introitus was not too narrow, one should endeavor, where possible, to remove tumors larger than the size of an infant's head by the vaginal method and by skillful morcellement. Special practice was needed for this, a special supply of instruments and good assistants.

As to ovarian tumors, one should exclude from the vaginal operation all solid and malignant tumors, as well as all cases complicated by adhesions, by intraligamentous location, by axial rotation and other disturbances. But even the uncomplicated cystic tumors were better removed abdominally because in this way the implantation of particles of the growth in the abdominal cavity was most surely prevented. The small opening in the fornix in colpoceliotomy brought with it the consequence that the tumors could not often be reached without morcellement, a course which in all epithelial neoplasms should be decidedly rejected. On this account vaginal ovariectomy ought to be generally dropped, in spite of the ease with which it could often be carried out. The vaginal operation was to be preferred occasionally in the case of incarceration of a cystic tumor during labor. This was also true of ovarian abscesses or suppurating unilocular tumors situated in the pelvis. There the author recommended the following procedure: First, the kind of bacteria contained in the abscesses was determined by careful aspiration with a fine needle. If the contents turned out to be of a septic nature a vaginal incision should be made and the healing of the abscess cavity awaited in order to remove the tumor abdominally afterward. In the case of harmless bacteria and of all large and multilocular tumors, one should without hesitation operate abdominally through a large incision, and with the endeavor of removing the tumor intact if possible.

In the case of chronic inflammations, the abdominal route offered superior advantages when one considered the requirement of the conservative treatment. The ovary should be spared as far as possible. This must be the motto in all chronic inflammatory diseases, including tuberculosis of the inner genitals. The tube and the uterus were much more endangered in all inflammatory ailments than the ovary and, therefore, supposing that an operation is indicated, they need much more the radical removal. In view of the frequent occurrence of involvement of the appendix in chronic inflammation, abdominal celiotomy was expedient.

Chronic pelvic peritonitis should be classed with chronic inflammation of the genitals, and in so far as this causes continual complaint on the part of the patient, the abdominal operation

should be performed. Furthermore, retrodisplacement of the uterus, which was connected with pelvic peritonitis, belonged to the domain of abdominal celiotomy, and not to the vaginal operation.

Extrauterine pregnancy was also best dealt with by abdominal celiotomy. Only suppurating hematocele should be treated like a pelvic abscess and operated on vaginally.

As to malpositions of the genitals, the author took the position that in this case too much operating was generally done. No correction of the position was indicated in most instances. The cases in which it was indicated were, as a rule, complicated. Retroflexions of the uterus never needed correction of position in the uncomplicated cases. Among the complications he mentioned pelvic peritonitis. Here the ventral operation was indicated, consisting in a loosening of the adhesions and including the necessary operations on the adnexa, followed by ventrofixation, in order to lift the uterus out of the region of the adhesions. The other extremely frequent complication of retroflexion was the total relaxation of the organ and the sinking of the vagina. Relaxation of the lower uterine segment and atony of the muscle of the pelvic floor almost always went hand in hand. In this class of diseases, besides other splanchnoptotic phenomena (movable kidney, sinking of the stomach and transverse colon) there was also cystocele. No one of these states of relaxation of the urogenital apparatus could be healed by the abdominal method. Here the only method which would be successful with regard to the pelvic organs was a properly executed vaginal fixation of the uterus, combined with colporrhaphy and perineoplasty.

According to the author's conception and experience, abdominal celiotomy deserves the preference for the intraperitoneo-gynecological operations, but that a number of indications, rather sharply defined, remained over for colpoceliotomy.

As the best method for abdominal celiotomy, the author recommended his suprasymphyseal transverse incision through the aponeurosis, which, if rightly employed, could be used satisfactorily in about nine-tenths of the gynecological abdominal celiotomies. The incision through the skin could be made, if required, from one spine of the ilium to the other; the incision through the aponeurosis could be easily prolonged to the outside over the lateral edges of the rectus muscles. By doing this one was enabled to split the oblique muscles along the line of their fibres. The detachment of the aponeurosis from the rectus muscle should be effected upward as far as the navel, downward as far as the symphysis, whereby the pyramidal muscles remained upon the flap of the aponeurosis. If, then, the recti muscles and the peritoneum were severed in the linea alba, there was a very large opening of the abdominal wall, suitable for the largest operation, rendering it easier to operate deep down in the pelvis and in its lateral parts. In nearly a thousand operations the author had never once been obliged to

add to the transverse incision a longitudinal incision through the aponeurosis in an upward direction beyond the navel. The sewing of the abdominal wall was carried out in four layers: First, the peritoneum; second, the rectus muscles; third, the aponeurosis, and fourth, the skin. The sewing of the peritoneum and the muscles was carried out with a continuous thread of catgut, the sewing of the skin with interrupted silkworm sutures. The author attaches great value to the careful arrest of hemorrhage and to the exact connection and adaptation of the edges of the wound.

This kind of incision had the great advantage that, even with a moderate raising of the pelvis, it afforded the bowels greater protection against the outer world, and thereby prevented a number of injuries. He had a total mortality of 5.24 per cent., and remarked that the operations for carcinoma of the uterus which so heavily burdened modern statistics, as well as others carried out on nonaseptic subjects, had also been included. Convalescence was more rapid; the healing proceeded more quickly in patients operated upon the transverse incision, especially since following the example of American operators and of Kronig's treatment in Germany. He had allowed the patients to get up and move about in a short time. The healing of the abdominal wall was by primary intention in 95.4 per cent. with the transverse incision.

Intimately connected with the healing of the abdominal wall stood the quality of the scar and the question of abdominal hernia. The scar was extremely fine, never broad or disfiguring it disappeared gradually, according to the directions of the fibers of the skin in the lower abdominal region, sometimes to the point of complete invisibility. In the total number of cases post-operative herniæ were observed in 0.94 per cent., and he remarked that these occurred exclusively in the cases of suppurating abdominal walls. In those cases in which there was wound healing by primary intention, a hernia was not once observed in more than 300 cases investigated.

In the comparatively rare cases in which the author made a longitudinal incision in the linea alba, in cases of large solid tumors with complications of such a nature that an operation was expedient at the navel or in regions situated higher up, he considered that the best methods, according to his experience, were the incision according to Lännander and the overlapping suture which was practised by Dr. Charles P. Noble.

In pelvic abscesses the way through the posterior fornix was self-evident. In vaginal extirpations the author individualized, beginning the incision sometimes in front and sometimes behind. The median bisection of the uterus or else morcellement might be advisable.

If the radical operation was expedient on account of the sup-puration of the genitals, it might be desirable to apply clamps for two days and to employ iodoform gauze drainage. Other-

wise, if it was not at all possible, the peritoneum and the vaginal wound must be carefully closed.

DISCUSSION.

These two papers were discussed jointly.

DR. CHARLES P. NOBLE, of Philadelphia, said Pfannenstiel had presented the subject very much from the American point of view. The only point in which he would in any way differ from him was with reference to the question of how to deal with suppurating ovarian tumors. He (Pfannenstiel) advocated the incision and drainage of these septic ovarian tumors with the idea that the wound would heal, and then subsequently the tumor could be removed. In the author's own experience, in dealing with suppurating ovarian tumors, he had found very few of them that would heal. He had tried this method in a number of cases, and, as a rule, the drainage of the tumor was not satisfactory, and so it was necessary to operate with the field still more septic than in the beginning.

As to the removal of tumors of the size of a fetal head, which Prof. Pfannenstiel preferred to deal with by the abdominal route, or even smaller tumors, he heartily concurred with him. The only class of fibroid tumors in which he personally preferred the vaginal route was the one emphasized by him, namely, the septic fibroids, and then in the class of submucous fibroids or small fibroids, we could do a myomectomy rather than a hysterectomy. For operations on fibroids, even though small, in which we were going to do hysterectomy, personally he preferred the abdominal route.

He had the pleasure some two years ago of visiting Prof. Pfannenstiel's clinic, and of seeing him apply the principles which he had enunciated to-day, and the Pfannenstiel incision, as he saw him use it, gave him most admirable control over the field of operation. It seemed to the speaker that the special advantage which this incision had over the usual longitudinal incision was that it made a conservative use of the recti muscles. In the ordinary abdominal incision the tonic contraction of the muscles of the recti was of no service whatever in maintaining the wound in position during the process of healing. It was clear that with the Pfannenstiel incision the recti muscles acted as a conservative course in holding the wound together, and he thought this was a distinct advantage which it possessed over the longitudinal incision.

DR. CLEMENT CLEVELAND, of New York, spoke of the Pfannenstiel incision, saying that he made use of it to a large extent. He liked it. He found it of great advantage in many ways. One could see the pelvic organs; he could get at them more readily than by a longitudinal incision. Moreover, one could get rid of the intestines to a better extent by pushing them farther out of the way and be sure that they were not in the

field of operation. Again, one could reach the appendix very much more readily. He had been in the habit of removing the appendix if he saw any excuse for so doing, or if he had arranged with the patient beforehand to do so if he saw any reason for it. In the majority of cases patients desired to have their appendices removed if there was the slightest indication of disease about them. In fat women especially he disliked the longitudinal incision, and preferred the Pfannenstiel incision, because it extended close to the pubis; there was usually a large depression in the fat due to the overlapping of the predominant fat, and this crease or depression was very difficult to disinfect and sometimes it might be necessary with a long incision to extend beyond that point. It was most difficult to protect it from infection. In fat women he had found that most of his suppurative cases of the abdominal wall had started from the lower portion of the incision, and he was in the habit of making the Pfannenstiel incision in the line directly across from the anterior superior spine of the ilium rather lower. He was in the habit always of using a continuous suture on the peritoneum, and then bringing the muscles together with interrupted sutures, and now in all cases he followed the Noble method of overlapping the fascia, using a mattress suture. He had used to some extent chromicized catgut, although he preferred No. 2, sterilized. By putting in a suture of silkworm gut, passing through the integument, fat and fascia, one did not need a longer lasting suture of chromicized gut. He thought either No. 1 ordinary catgut or No. 2 was sufficient.

DR. I. S. STONE, of Washington, D. C., said that some years ago the members had discussions of this character, and on one occasion a distinguished foreigner came to America and introduced his method of performing various vaginal operations. He met with so much difference of opinion in this country and saw so many operations performed by some of our best operators by the abdominal route, that he went home and became an enthusiast on the abdominal route himself. He did not know how it might be on this occasion, but it was interesting for the members to go over the field again. He thought there were certain problems to be worked out in the abdomen which could never be solved by the vaginal route. Among other things, he mentioned the various procidentias, prolapses of the uterus and bladder, which very often have their origin in Glendard's disease, or dropping down of the viscera, not merely elongation of the ligaments in the pelvis, but beginning very much higher, and also hernia to fear back of that, as well as enteroptosis or dropping down of the viscera; it would be impossible for any man to go through the vagina and successfully treat such cases. If such problems were to be solved, it was by looking in the abdomen and studying the causes which lay behind these conditions. He mentioned two cases, one in which ileus was caused, and another in which there was acute bowel obstruction

produced by an appendix which was five inches in length and quite large, and which could not have been dealt with by the vaginal route.

Again, there were cases of not only stenosis due to tuberculosis, to carcinoma, but occasionally of congenital origin which could never be anticipated until the abdomen was opened. The tuberculous cases were of extreme importance. Gynecologists were apt to find in the abdomen of any woman rather unexpectedly a tubercular condition of the bowel, the mesentery or omentum. It would be very annoying to him if he should undertake to do a vaginal hysterectomy, or any of the operations which had been mentioned to-day, and find there was ileus, later on carcinoma, possibly tuberculosis, obstruction or other troubles from the appendix, or dislocations of the viscera which one ought to treat directly by extension or by the application of knowledge during the inspection of the abdomen.

He had tried the Pfannenstiel incision in a number of cases and believed it was strictly applicable to pelvic work. If we had some pathological condition above the pelvis, he was not quite sure that the Pfannenstiel incision would do. There was a good deal of room for improvement in that regard.

DR. J. RIDDLE GOFFE, of New York, thought it was extremely interesting to hear from Professors Pfannenstiel and Martin in regard to the relative merits of the two routes of attack after their many years of experience in their country and their extensive observations of the work of other operators. Personally, he had been studying the vaginal route as a method of attack for some years, and for a number of years he adopted it quite exclusively for the purpose of learning its limitations, so that now he did not regard its field of application quite as wide as when he first began. Cases of pelvic abscess, especially attended with infection, elevation of temperature and high pulse, were always better attacked through the vagina; also in cases of hemocele, where we had the débris of an ectopic pregnancy, especially if it had become infected, he did not think there was any question in the minds of any of the members that such a condition was better and more safely attacked through the vagina.

When it came to the consideration of the treatment of fibroid tumors, there was difference of opinion. He had found that many cases of fibroid tumor could be subjected to attack by the vaginal route, myomectomy done and the uterus saved. He was doing this repeatedly, whether the tumor be inside the uterus, whether it be subperitoneal or intramuscular, and unless the tumor was larger than a fetal head it could be generally attacked with safety and success through the vagina.

What was the advantage of attacking it in that way over attacking it from above? He knew of none where we had that simple condition, but if we had a case which was complicated by many of the relaxed conditions found in the pelvis, as, for instance, an extensive laceration of the cervix, with endometritis,

perhaps rectocele and cystocele, with fibroid tumors, two or three small ones perhaps, or one moderately large tumor, the surgical work must be done through the vagina, and it seemed to him it was the rational, easy route of attack, everything being treated at that one sitting and attacking it through the same route. We did not need to curette the uterus, sew up the cervix, do an operation for rectocele and cystocele below, and change the position of the patient and attack the fibroid tumor or tumors from above. But it could be done through the vagina in a much simpler way with one incision. Cases of salpingitis, chronic salpingitis, complicating retroversion of the uterus or retroflexion, with adhesions, many of them being accompanied by other lesions, such as laceration of the cervix, with some descensus, rectocele frequently, could be dealt with surgically from below. Instead of operating through the vagina and repairing the lesions in sight, then changing the position of the patient and doing a laparotomy, he saw no reason why all of this work could not be done through the vagina, and he did not advocate attacking any chronic condition of the ovaries and tubes, whether accompanied by these other conditions or not, through the vagina, and he found that his results were as satisfactory, if not more so, than when he attacked them, as he did formerly, through an abdominal incision.

DR. HERMAN J. BOLDT, of New York, stated, in referring to acute tubal inflammations, that only in rare exceptions was it necessary to operate upon them until the acute stage had passed off. If a tube was greatly distended with pus, then it stood to reason that the pus should be evacuated, and the only proper way to do that was through a vaginal section, and then leave it for time to determine whether or not subsequent surgical interference would become necessary.

So far as conservative work through the vagina in cases of tubal inflammation, with adherent retroflexion of the uterus, was concerned, personally of late years he had preferred the abdominal route because it seemed easier for him to do such conservative work as might be necessary. In about 75 per cent. of these cases a catarrhal chronic inflammation of the appendix was found. This had been proven to him by microscopic examinations of several hundred of these appendices which had been removed under these conditions. He had made it a rule in all these cases, when the appendix was removed, to submit it to a pathologist, and it was found that in at least 75 per cent. of the cases of pelvic inflammation the appendix was also affected. In that class of cases he thought the abdominal operation was to be preferred. There was no question, however, but what the vaginal operation had a field, but its limitations should be defined. Fifteen years ago he preferred the vaginal operation, and thought there were a great many indications for it, but since that time from year to year these indications had become more and more limited.

With regard to shortening the round ligaments by the vaginal route, we must bear in mind that in many of these patients, with movable retroflexion of the uterus, where the ligaments were drawn out, the thinnest part of the ligament was near the external part of it. Now, through the vagina, it was not possible to get the thinnest part of the ligament; the thickest part of it was drawn out and shortened to hold the uterus in anterior position. One should work in the opposite direction. If one decided to shorten the round ligaments for posterior displacement, then the Alexander operation was the one by preference.

DR. ROBERT L. DICKINSON, of Brooklyn, N. Y., said that where the Pfannenstiel incision was used in very fat women, where there was much contusion of the adipose layer, there was great risk of suppuration. There was an ugly pocket between this incision and the top of the symphysis in which pus might collect, ugly to drain, and hard to diagnose; therefore, he was restricting transverse incisions to women in whose cases he hoped to get primary union. Professor Pfannenstiel had reported 95 per cent. of clean primary unions. The speaker's own results had averaged 100 per cent. in thin women with fairly good tissues, but not nearly as good in stout women.

Concerning the matter of vaginal *versus* abdominal attack, it was largely a question of personal skill. The man who had done a good deal of operating from above would continue to operate on cases that another surgeon would attack by the vagina.

The speaker believed that a mobile ovarian cyst could be removed through the vagina. Many parovarian cysts could be simply opened and drained through the vagina, instead of making a gap in the broad ligament from above which involved a considerable operation.

DR. SETH C. GORDON, of Portland, Maine, said he had a certain use for vaginal operations, but they were almost entirely confined to pus in the tubes. He waited until he was quite sure pus was present, and then he made an incision, drained the tubes and let them alone. He did not believe with Dr. Goffe that one should handle acute inflammatory tubes much, but they should be drained and let alone. The idea of making an incision and of handling these tubes when the patient had a temperature of $102\frac{1}{2}$ was all wrong. This was the only possible use he had for vaginal work. He had never employed the Pfannenstiel incision for any purpose whatever. He had no doubt it was valuable, but he preferred a simple, perpendicular, longitudinal incision large enough to accomplish all that he desired, and if he found there were other conditions coming up that necessitated enlarging the incision, this could be done. In these days, when one made an incision large enough to introduce the hand, it was important to examine the gall-bladder and the appendix, and if anything needed to be done in either of these conditions, it could be done through an incision sufficiently long to introduce the hand.

The speaker's method of closing the abdominal incision was to carry through silkworm gut sutures from within outward always, never carrying his needle from above downward, but from within out threading the end separately. In this way he did not drive any germs through the skin. If the incision was long he tied about half-way up and started again. He left these silkworm-gut sutures in at least two weeks, and he did not object if they were allowed to remain longer if they did not produce any inflammatory condition of the skin. This gave ample time for absolute coaptation of the parts, so that he had not seen a case of hernia in years and years. He had resorted to vaginal hysterectomy a few times and did not like it, probably because he had not the skill to do it as well as his German and French confrères. However, Jacobs, who came to America and showed American operators how to do vaginal hysterectomy, after seeing American surgeons do abdominal hysterectomy, when he returned became a convert to that operation. Many of us might go over to France or to Germany and if we saw vaginal work done very frequently and for a long time we might become converts to vaginal hysterectomy, but the speaker was satisfied to adhere to the abdominal route.

DR. HOWARD A. KELLY, of Baltimore, said it appeared to him the first step in this direction was to handle through the vagina all those cases in which there were injuries to the pelvic floor with prolapse of the bladder and intrapelvic lesions, treating all of these conditions through that one route. The milder cases of pelvic inflammatory diseases could be handled more regularly in this way. The more serious, aggravated cases of pelvic inflammation, where there were masses wedged down behind both broad ligaments, with the uterus frozen in between them, so to speak, were puzzling to a man who had not done much vaginal work. Bisection of the uterus in these serious cases had not been sufficiently understood as a means of simplifying difficult cases, making them safe. He thought we should do our operations for small fibroid tumors through the lower route, but hardly adopt that for the larger fibroids.

DR. C. C. FREDERICK, of Buffalo, N. Y., said he had been doing abdominal and vaginal work for a series of years, and from his own personal stand-point he had crystallized in his own mind the indications for adopting each route in a certain class of cases. He did not believe that any operator who confined himself exclusively to one route or the other was doing his patients or himself justice, because each method had its own field of usefulness. He agreed with Dr. Goffe that cases of acute pelvic inflammation seen within twenty-four or forty-eight hours after the first onset could be successfully treated by vaginal section and drainage of the pelvic cavity with gauze stripping out the tubes and relieving them of the local source of infection, etc. These patients would get well in ten or twelve days, whereas otherwise they might go on for five or six weeks

and have pelvic abscesses and suppurating tubes afterward. This was a curative process in the incipient stage of acute pelvic peritonitis from tubal infection. He never attacked chronic inflammatory disease of the tubes and ovaries from above; he always went in from below. These were conditions where conservatism in the process of operation was necessary. One should strive to save as much of the tube and ovary as he could. If he went in and found a tube patulous, he left it. If, on the other hand, he found a tube which contained pus, then he would take it out. Ordinarily, if he found an abscess in the ovary he did not hesitate to open it, treat it with carbolic acid, and leave what ovary there is because the woman might need it in the future. All large tumors, cysts, etc., he would attack from above, but small fibroids of the uterus, especially the submucous class, which produce a great deal of hemorrhage, he frequently removed by opening the fornix, bringing the uterus out into the vagina, doing a myomectomy, closing the incisions, returning the uterus and leaving it for future functionation. Small ovarian cysts should be taken out through the vagina, opened in front and on the side, opening through the anterior vaginal fornix, separating the bladder, puncturing the cyst, draining off the fluid, pulling it out and tying it off. This was an easy operation, and patients who underwent these vaginal operations were just as well after as those who had undergone operations for laceration of the cervix.

DR. MARTIN, in closing the discussion, said he had seen many operations done by the abdominal route for procidentia, and the results had not been good.

As to the frequency of involvement of the appendix, when operating for other intraabdominal pathological conditions, he had given attention to the appendix ever since he began his surgical work, more than thirty years ago, and the percentage of cases in which he found appendicitis associated with disease of the appendages was very small. Appendicitis seemed to be more frequent in America than in Germany, and he thought the frequent existence of constipation and other kindred disorders reported in American statistics were responsible for this fact.

DR. THOMAS S. CULLEN, of Baltimore, read a paper entitled
THE CONDITION OF THE MUCOSA IN CASES OF UTERINE MYOMATA.

DR. HUNTER ROBB, of Cleveland, Ohio, read a paper entitled
SOME FURTHER EXPERIMENTAL WORK IN SEVERING THE PELVIC
VESSELS IN BITCHES AND ITS BEARING ON
RUPTURED ECTOPIC PREGNANCY.*

DR. RICHARD R. SMITH, of Grand Rapids, Mich., followed with a paper entitled

INTRAABDOMINAL PRESSURE.†

*This paper will be published in this JOURNAL.

†See page 242.

DR. HOWARD A. KELLY, of Baltimore, read a paper on VERTICAL AND HORIZONTAL AMPUTATION OF THE UTERUS.*

DISCUSSION.

DR. AUGUST MARTIN, of Greifswald, Germany, said that he proposed the enucleation of myomata more than twenty years ago, and in so doing he frequently resected large portions of the uterus. This encouraged him to do the same in cases of metritic uteri, and he had performed resection for a long time in a number of cases.

He had removed in many instances myomata from women who subsequently became pregnant. In those cases in which resection was practised there was no danger from parturition setting in. In fact, it would be wise to order these patients to pay attention early to pregnancy and they should be under the supervision of a physician. In his early days in such cases he curetted with a view to arresting hemorrhage. He recalled one woman whose uterus he curetted eighteen times, and then did a hysterectomy, in order to stop a hemorrhage which was dangerous to the life of the patient.

DR. F. PFANNENSTIEL, of Kiel, Germany, in speaking of technic said he did not know whether in the cases in which he (Dr. Kelly) made cuneiform section he took out the whole mucous membrane in the upper parts or not, but probably not. This was an important point. He had found either the surgeon must conserve the uterine canal, so that there could not be atresia or hematometra as a consequence, or if more tissue was cut out, then it was necessary to take out the corners of the uterus where the tubes entered the uterus. He had performed this operation mostly on women who were advanced in age, and the indication was a chronic metritis. He appreciated this method especially when he had to do with prolapse of the uterus. He had performed the operation in this way: He cuts out both corners and leaves only a small portion of the corpus uteri in the lower part. Sometimes he left only the whole cervix and both edges of the uterus, so that he had a small metritic uterus, but large enough to support the bladder, and he thought this was an important part of Dr. Kelly's work. He advised the members to follow Dr. Kelly's proposition.

DR. HERMAN J. BOLDT, of New York, said that, so far as myomatous uteri were concerned, he had found that whenever the local condition was favorable for such an operation he endeavored to practise it, and a number of New York men, since the publication of Zweifel, calling attention to the importance of leaving as much uterine structure with as much mucosa as possible to preserve menstruation for the future, especially in young women, had endeavored to do the same. Those who had followed this method could substantiate everything Dr. Kelly had said in favor of that method of treatment.

* This paper will be published in this JOURNAL.

As to the other class of patients upon whom Dr. Kelly had operated for chronic inflammatory conditions or firmly fixed fibroids of the uterus, he had not done the operation and had never thought of doing it, but since listening to Dr. Kelly's remarks he would be inclined to try it.

DR. GILL WYLIE, of New York, said there was a certain part of Dr. Kelly's paper which not only interested him, but which was new to him. The idea of saving the mucous membrane above the os internum, with the object of its being useful, was undoubtedly excellent. He had had a number of women who had menstruated after the removal of fibroids. He thought there were many cases of fibroid tumors of the uterus where, instead of removing the tumors, the uterus could be curetted and other treatment resorted to, particularly where these tumors were complicated by inflammatory troubles, and the women could go on and have children afterward. He believed that a good deal of conservative work in that line could be done.

DR. SETH C. GORDON, of Portland, Maine, said that chronic metritis meant chronic inflammation ordinarily. Metritis occurred generally after abortions or after delivery and was infectious. These cases were comparatively rare. But a large class of cases were found which he characterized as subinvolution of the uterus or chronic hyperplasia of the uterus, that is, where the uterus never involuted after labor. These cases were attended with a thickened mucous membrane which bled readily, and one could get hemorrhage from that condition. This was entirely different from chronic metritis. It was a lack of normal physiological involution. In 1884, at the congress held at Copenhagen, he read a paper in which he outlined a method for remedying that condition, which was to take out from the cervix through the vagina on each side a wedge-shaped piece from the cervix, as large as could be borne, thus leaving a proper canal. He had performed that operation a great many times in his life, and had never yet failed to see very rapid involution of the uterus, and within three or four months the uterus was found just where it was wanted. At the same time, he resorted to very extensive curetting, washing out the uterus thoroughly with bichlorid solution and applying iodine, or better, carbolic acid, and in this class of cases he had seen most wonderful results. These were not cases of chronic metritis which in his experience was very rare. Chronic metritis would leave a uterus large, but the ordinary hyperplastic uterus might have been occasioned by the woman getting up too soon or something of that sort, not in any sense the result of inflammation, and he thought a great many men who had adopted this plan for this condition had noticed that within two or three months the uterus was reduced to a normal condition and there would be no more hemorrhage afterwards.

DR. J. RIDDLE GOFFE, of New York, said he could understand the object of conservative surgery either upon the appendages

or uterus which looked toward future childbearing. He could understand, too, conservative surgery which looked toward the continuation of ovulation, but he failed to see the great object to be accomplished by simply arranging things so that a woman might have a vaginal discharge each month. In other words, what was the essential part of menstruation? Was it the ovulation connected more or less therewith, or was it the discharge that came from the endometrium and the lining membrane of the tube? For his part, he saw no object to be accomplished for a healthy woman in having this discharge from the uterus or from the Fallopian tube. On the other hand, much might be gained by conserving the ovary or ovaries and conserving the function of ovulation, but in his experience the majority of women were glad to get rid of this vaginal discharge every month.

DR. A. LAPHORN SMITH, of Montreal, said that whenever he thought of doing conservative surgery he recalled the words of Scripture, "Man is born with trouble." This was his experience. Should the ovaries and tubes be left? He had done this for the last few years and, as Dr. Kelly had pointed out, it was an advantage if a woman had three or four menstrual periods or what corresponded to them, in that it diminished the troubles of the premature menopause or artificial menopause. It must be remembered, however, that in the majority of cases of fibroid tumors the ovaries and tubes were diseased.

Not long since he visited the Mayos, and after Dr. William J. Mayo had removed a large fibroid tumor and had found that the ovaries and tubes were diseased, the ovaries being as large as hen's eggs, the speaker said to Dr. Mayo, "Are you going to leave these?" Dr. Mayo replied, "I do only one of two things—take them out, or leave them alone. I never cut into them or tamper with them." He was willing to risk leaving these in this case. Personally, the speaker would have removed the diseased ovaries and tubes.

DR. I. S. STONE, of Washington, D. C., said the only thought he had to leave with regard to the matter of the operation brought forward by Dr. Kelly was one that had come to his mind very recently in connection with a case upon which he operated four years ago and did a myomectomy by the abdominal route. He happened to know that the young woman was contemplating matrimony. The operation was attended with great difficulty. His own judgment was not entirely exercised in this case, however, because the family physician wanted to operate, and the speaker assisted him. The result of the operation was adhesion of the transverse colon to the seat of operation whence the myoma was removed. A V-shaped colon occurred. She had much trouble, resulting in dyspepsia, with nervous trouble associated with it. Finally, the tumor grew again, and a second operation was done by himself, which was very difficult, taking off the entire omentum, jeopardizing the circulation of the transverse

colon because the mesentery was injured, but, nevertheless that woman, after much trouble, recovered. But in the meantime she had conceived, and he found in that tumor as large as a child's head hundreds of fibroid centers. There was a little fetus found also. That woman had married, had conceived, and was happy as a result of an operation of that character.

DR. EGBERT H. Grandin, of New York, asked how horizontal resection of the uterine body differed from the following technic which he had been pursuing for sixteen years and which Baer introduced twenty years ago: Tie off the upper portion of the broad ligament toward the uterus, leaving the ovaries and amputating the uterus above the bladder reflection, cupping the cervix, carrying the slight bladder flap over the cervix, and leaving the healthy cervix in. This was supravaginal hysterectomy for fibroids and was applicable, in his opinion, whether there be one or sixteen fibroids. If an ovary was sufficiently diseased to require operation, he would take it out. If a part of an ovary was conserved, it might have to be taken out later.

DR. C. C. FREDERICK, of Buffalo, New York, had in fibroid cases, where he had done myomectomies, practised partial removal of the body of the uterus, retaining enough of the mucosa and enough of the uterine tissue to make a fairly good uterus that functionated afterward.

Although it was a departure from the subject of Dr. Kelly's paper, he wished to take issue with those gentlemen who were so radical on the question of the removal of the uterus *in toto* when there were a few small fibroids in the body of the uterus. For years he had practised myomectomy. He had done probably two hundred of these operations, and of this number he had the satisfaction of reporting that there were not more than ten or a dozen women who had been rendered sterile. The others had no accident during childbirth or pregnancy following myomectomy. He was cognizant of but one woman who had returned with fibroids in the uterus, and that woman had an incarcerated fibroid as large as a hen's egg six years after myomectomy had been performed. He then did a supravaginal amputation, but only one in the whole list of cases. In his judgment, myomectomy, if properly done, for young women during the active menstrual period, was a proper operation under proper conditions, and he did not believe in so radical an operation as supravaginal amputation because a woman had to get rid of the fibroids.

DR. AUGUST MARTIN desired to add a few words of historical interest to the discussion. The idea of producing involution of the hypertrophied uterus, he said, was raised by Dr. Carl Braun, of Vienna, in the year 1861-62. The speaker advanced an idea in a paper which he presented before the German Congress of Scientists and Medical Men similar to the one put forth by Dr. Gordon, namely, to cut out a large piece of the corpus uteri to reduce the involution of the hypertrophied uterus, but

at that time this idea was vigorously combated by his German confrères. After the operation of resection of the uterus pregnancy rarely ever occurred.

DR. KELLY, in closing the discussion, said that all over the country in medical journal literature and in text-books, the proper treatment of fibroid tumors of the uterus was considered to be either enucleation of the tumors, so-called myomectomy, or amputation at the cervix. After one had done many of these operations he did not think of leaving a part of the uterine body with the intention of keeping up the menstrual function.

In reply to Dr. Grandin, the operation he (Dr. Kelly) had described differed from horizontal amputation at the cervix, even though one did cut through at the level of the vesical peritoneum without detaching it. His experience had been that these women rarely continued to menstruate with any regularity afterward. In doing that operation no emphasis was laid on retaining any portion of the uterine mucosa in order that the woman might continue to menstruate.

Of two or three hundred myomectomies there have been 2 per cent. of return of tumors, and between 12 and 15 per cent. pregnancies.

VENTROSUSPENSION AN UNSAFE OPERATION FOR POSTERIOR DISPLACEMENT OF THE UTERUS DURING THE CHILDBEARING AGE.

DR. EDWIN B. CRAGIN, of New York, read a paper on this subject in which he spoke of two varieties of attachment of the fundus to the abdominal wall:

1. A ventrofixation, in which the fundus is sutured firmly to the anterior abdominal wall, the sutures passing through peritoneum, fascia and muscle in addition to including a portion of the fundus.

2. A ventrosuspension, as recommended by Kelly, in which the sutures, aside from including a portion of the posterior wall of the fundus, pass through only the peritoneum and subperitoneal tissue of the abdominal wall, the object of this operation being the formation of a suspensory band or bands which will allow mobility of the uterus, but not retroversion of it.

The anatomical results of pregnancy in a uterus firmly fixed to the anterior abdominal wall are fairly uniform.

1. The only part of the uterine body which develops and expands to accommodate the growing fetus is that behind the point of suture attachment to the abdominal wall.

2. The part of the uterine wall in front of and below the point of suture attachment thickens and hypertrophies even to the extent in some cases of producing a muscular tumor obstructing the parturient canal.

3. The part of the uterine wall behind the point of suture attachment may become so thinned during pregnancy as to rup-

ture during labor. This has been reported in at least six cases by Von Guerard, Dickinson, Brodhead, Clark and Bowley, Edebohls and Ingalls.

4. The cervix is thrown upward and backward so that at full term it may be at the level of, or above the promontory of the sacrum.

The forms of dystocia which have been most commonly met with are:

1. A malpresentation of the child, especially a transverse presentation. This transverse presentation was noted in fifteen of the twenty-one cases of Cesarean section for this condition collected by Lynch and occurred in all five of the cases operated on by the writer and here reported.

2. An ineffectual labor with cervix undilated and high up. This high position of the cervix is noted in most of the cases demanding Cesarean section and was present in all of his cases.

3. An obstruction labor, the obstruction being produced by the thickened anterior uterine wall.

It is freely admitted that many patients upon whom a ventrofixation has been performed have passed through pregnancy and labor without dystocia resulting therefrom. Up to three years ago, it was the author's custom to perform ventrofixation or ventrosuspension for posterior displacement needing operation and his records show seventy cases of ventrofixation or ventrosuspension, mostly the former, in which at least one ovary and tube were left and hence the possibility of pregnancy preserved, yet so far as it is known to him no dystocia has occurred in these cases, perhaps because the fixation sutures did not pass posterior to the center of the fundus. However, including the five cases reported in this paper, there are now at least forty cases of Cesarean section on record which were demanded by a previous ventrofixation of the uterus. The profession is certainly ready to accept the statement that ventrofixation is an unsafe operation for a posterior displacement of the uterus during the childbearing age.

The object of this paper is to call attention to the fact that a ventrosuspension is not a safe operation during the childbearing age for the reason that an intended ventrosuspension may become a ventrofixation in one or other of the following ways:

1. The area of adhesion between uterine fundus and abdominal wall may be broader than expected and the resulting band be too firm to allow uterine mobility.

2. Infection of the abdominal wound may fix the fundus and anterior uterine wall firmly to the abdominal wall.

3. A ventrosuspension which allows a normal delivery in the first pregnancy following operation, may subsequently become a ventrofixation and produce dystocia so marked as positively to indicate Cesarean section in the second postoperative pregnancy.

In the five cases of Cesarean section necessitated by ventrofixation, which the writer now desires to place on record, the operations for the retroversion were all performed by different men and,

save in the fifth, it is not known whether a suspension or a fixation was intended.

DISCUSSION.

DR. J. WHITRIDGE WILLIAMS, of Baltimore, said that at a meeting of the Southern Surgical and Gynecological Association, held about two years ago, he reported his experience with this operation, and at that time he did two Cesarean sections, and had very difficult cases in addition. One of these was a difficult version and extraction, and the other one ended in mutilation of the child which was already dead when he saw it. In this case the woman had an operation performed; she fell into labor; everything seemed quite satisfactory; the position of the cervix was not extremely posterior, and after she had been in the second stage of labor two hours he determined it was time to interfere. The cervix was possibly 5 cm. in diameter, was readily dilated, and on passing his hand up the cervical canal it went up four inches and 10 cm., coming in contact with a rigid tissue, separating the anterior portion of the uterus in two parts. In front of the partition lay the feet of the child, and it was impossible to reach them. Immediately the woman was prepared and a Cesarean performed. On examining this uterus afterward it was found, contrary to the general rule, that hypertrophy had occurred in the anterior as well as the posterior wall of the uterus. Instead of the hypertrophy leading to a thick, muscular tissue, it led to a more general hypertrophy, and this hypertrophy had buckled the anterior uterine wall between the cervix and the point of incision, doubling on itself and forming sacculation.

It was interesting to note that of these four cases of dystocia, one was a definite fixation done with catgut sutures. Who did it he did not know. He did not know who operated on the second case. But in the other two cases operated on in the Johns Hopkins Hospital the uterus was suspended according to the technic of Dr. Kelly and the operations were done either by Dr. Kelly or by some of his assistants. After this and other experiences they had practically abandoned ventrosuspension in Baltimore and had taken up other methods of treating retro-displacements of the uterus. The speaker did not believe that ventrosuspension was an operation to be performed with impunity upon women in the childbearing period.

DR. RICHARD C. NORRIS, of Philadelphia, said that ventrosuspension had always been a popular operation in his community. Following Kelly's technic, and shortly thereafter the modified technic by Dr. Penrose, he had had many opportunities to deliver women who had been operated on in his community by that method. The first serious obstruction to labor was a case reported years ago, the patient having been operated on by Dr. Noble, who did an anterior ventrofixation. Another case was operated on by Dr. Montgomery which he had seen within the last

two or three years in which there was a band of adhesion largely composed of muscular tissue evidently, but in which pregnancy continued without interruption. The woman came to term; she had a normal presentation, and in consultation he delivered her with forceps, and after emptying the uterus found beneath the abdominal wall a band of muscular tissue which extended from the fundus of the uterus down toward the abdominal scar. This band was an inch and a half or two inches in diameter. This had allowed the uterus to continue throughout pregnancy, did not interfere with its contraction after labor, and it was interesting from the fact that during the puerperium this muscular band underwent involution, and at a later period could scarcely be recognized.

He had delivered at The Retreat nineteen or twenty women following ventrosuspension without interference with pregnancy or labor. It was his opinion that the profession at large had been warned against ventrosuspension and had abandoned it as an operation on women who were likely to become pregnant.

DR. EDWARD P. DAVIS, of Philadelphia, had delivered a number of women by other methods who had been previously operated on by this method of treatment. He had seen some complications arise during pregnancy not only from interference with the development of the uterus, but also from interference with the position and function of the intestines during pregnancy. On one occasion the intestine seemed to have become partially occluded, and at one time it seemed probable that operation must be undertaken. He thought the operation had no field in childbearing women—the operation of fixation certainly not. The operation of suspension was uncertain or, if not uncertain, likely to become a fixation, as Cragin had pointed out, and, at all events, was uncertain and dangerous.

DR. HENRY D. FRY, of Washington, D. C., had had between thirty and forty cases of labor after ventrosuspension without any trouble, and he had had occasion to do Cesarean section for ventrofixation. This patient was operated on by a colleague for a ventrosuspension and there was some suppuration in the wound. The uterus had become fixed. This woman was in labor some time when he saw her with the os pointing posteriorly and a pad of muscular tissue in front, and he delivered her by Cesarean section. Now, he believed that a better method of delivering these women, instead of doing Cesarean section, was to cut the band loose from the abdominal wall, let the uterus rise in the abdominal cavity, and then the case would progress normally and would have a normal labor.

He asked Dr. Cragin whether in any of the five cases reported he left the uterus attached to the band.

DR. CRAGIN replied he had not; he separated the attachments afterward.

DR. FRY (resuming) said that if this band was not separated there might be a recurrence of the trouble, and another Cesarean

section. But he believed that if the uterus was cut loose, and the parts sewed up to prevent hemorrhage, the uterus would rise in the abdominal cavity, and the woman could be delivered normally. If Dr. Williams had done this in his case, it would not have been necessary to have done a Porro operation. He certainly believed that, instead of performing Cesarean section in these cases, the uterus should be liberated, and the women allowed to have a normal labor at term.

DR. GILL WYLIE, of New York, recalled very well when this operation was first done, and in all discussions he had taken this ground, that if practitioners were educated in the laws of physics and mechanics they would not perform that operation and never would have advocated it. He cited cases to substantiate his contention.

DR. SETH C. GORDON, of Portland, Maine, said that for eight years he had doing been what was better known as the Gilliam operation, an operation devised by his assistant without knowing anything about Gilliam's operation, that is, carrying the round ligament up through the rectus muscle on each side and fastening it there on top of the fascia, taking a pair of forceps and plunging it down through the rectus muscle, getting hold of the round ligament, bringing it up within two inches of the peritoneum, and fastening it there, thus having a suspension without troubling the top of the uterus. He knew of some cases where delivery had been accomplished without any trouble, and Dr. Thompson (his assistant) had not heard of any trouble arising from any case of pregnancy or delivery in any of the cases. There was no danger of adhesion, so far as he knew, and they had been doing this operation for eight years, and not a case had come to their knowledge where there had been any trouble following that operation.

DR. A. LAPHORN SMITH, of Montreal, said he had done 200 ventrofixations. One woman had a miscarriage. It was not an operation intended for women who were going to have children. There were two things to do. In a case of retroversion the uterus should be fixed, and the tubes, if diseased, should be removed. The uterus should be fastened firmly to the abdominal wall, as this would give the best satisfaction.

DR. CRAGIN, in closing the discussion, said that the point brought out by Dr. Williams that there was a folding of the uterus on itself in many cases was corroborated by his own experience and that of others. If the ligament was separated in some cases the uterus would apparently resume its normal shape. He felt with Dr. Norris that, in all probability, from ventrosuspension there would be little if any dystocia, and he kept this operation up much longer than otherwise for that reason, but having met with a few cases where ventrosuspension was intended and ventrofixation resulted, with dystocia, demanding Cesarean section, he had abandoned it.

In regard to the suggestion of separating the ligament at the

time of labor, these cases had been in labor for a number of hours; that it was only after nature had tried to dilate the cervix and to deliver the child the women were brought to the hospital and were seen by him. It was not good judgment to open the abdomen, sever the ligament, close the abdomen, and let the woman go on with labor. It would seem to him that the fetal mortality would be increased by this procedure. He admitted the feasibility of it during pregnancy, separating the ligament, and letting the uterus develop in a normal way, but as for doing it at labor it did not appeal to him.

Ever since abandoning ventrosuspension he had been doing the Gilliam operation, and had had no dystocia from it, and it seemed to fulfill the indications very nicely. His method of doing it was through a Pfannenstiel incision, making a transverse incision, bringing the round ligament up to the recti underneath the fascia inserting a suture which closed the outer ends of the incision, including the round ligament, and closing the fascial incision as was recommended by Pfannenstiel.

DR. J. WHITRIDGE WILLIAMS, of Baltimore, read a paper entitled

IS PUBIOTOMY A JUSTIFIABLE OPERATION?*

DISCUSSION.

DR. EGBERT H. GRANDIN, of New York, said that basing his judgment on American statistics, since he could best judge of the work from that stand-point, he would reject pubiotomy or hebostiotomy, on account of the morbidity and mortality rates. After listening to Dr. Williams's paper, he was willing to modify a previous statement he had made in another discussion to this effect: he excepted Dr. Williams from that statement, but only hoped that Dr. Williams would be as fortunate in his future researches. The speaker had said in a paper previously read that he could not conceive of hebostiotomy or pubiotomy being made an elective operation any more than in the past he was willing to admit that symphysiotomy could become an elective operation. He contended that in the border-line cases, other things being equal, Cesarean section—to his mind the future operation as performed in America—would show a less morbidity rate and a less mortality rate on the side of the women, with as many, if not more, living children than hebostiotomy ever would. He was not willing to admit from his stand-point that in the lesser grades of pelvic contraction the induction of labor was a lost art. It all depended on how the obstetrician induced labor.

DR. F. PFANNENSTIEL, of Kiel, Germany, said the paper of Dr. Williams had interested him very much and he could confirm his conclusions. He had performed twenty-seven hebostiotomies without maternal and without fetal mortality. He concurred with Dr. Williams as to the indication for the operation,

* See original article, page 202.

namely, a conjugata vera of 7 cm. It all depended upon the relation between the child and the pelvis. He agreed with him also that this operation should not be done in infected cases. He had performed the operation in one infected case, and the woman had considerable temperature after it, was very ill, but finally recovered. This one experience had taught him not to do the operation again in an infected case.

Concerning the indications for the induction of premature labor, he agreed with Dr. Williams, and pointed out that pubiotomy was not an operation for the general practitioner to perform. It required an expert to do it. With regard to the induction of premature labor, he did not think the results were as bad as had been stated in many papers that had been published from time to time. He had not had any maternal mortality from the induction of premature labor in over 150 cases in his practice, but in his last fifty cases there was a mortality to the children following this method. If all cases that left the hospital after some weeks were considered, then he had lost 18 per cent. While we could content ourselves with doing this operation, there must be a special indication for it.

DR. EDWARD P. DAVIS, of Philadelphia, said it was interesting to note that Boone in a series of fifty-two cases did not state the fetal mortality, although he made the simple statement that he had done fifty-two operations with no maternal mortality.

As regards the statement that 70 per cent. of labors in moderately contracted pelves would terminate spontaneously, the speaker's experience in a series of 1200 cases of contracted pelves of all sorts was that fully 80 per cent. would terminate in spontaneous labor, and therefore a larger number of these border-line cases should have the test of labor.

As regards the mortality of the early Cesarean section, he thought all of the members were agreed as to that. With reference to the mortality of Cesarean section after labor had developed, he thought the essayist had estimated it much too high. In his own experience, including the cases in which labor had been induced with the hope of avoiding Cesarean section, the maternal mortality was 2.3 per cent. and the fetal *nil*. Forty-two cases had gone into labor, had forceps or version tried, some had induced labor, but they had had a fair test of labor for a number of hours.

DR. ROBERT A. MURRAY, of New York, said he had not had any experience with pubiotomy, but judging from the statistics he thought it had a field. After doing symphyseotomy for sometime and elective Cesarean section, he thought if he had the opportunity he would do pubiotomy, but in the cases that had come to him in consultation he had never felt he could subject a patient to that risk. He felt more certain of Cesarean section after labor had commenced. Where he had waited for hours for patients to undergo the test of labor, he had not had occasion to do pubiotomy, but had done Cesarean section in some

of them, and would not change this method unless the statistics of pubiotomy were much more favorable than those that had been given, and the cases very carefully selected with regard to the size of the pelvis.

DR. BARTON COOKE HIRST, of Philadelphia, had not had the pleasure of hearing Dr. Williams's paper, but from reading a synopsis he understood the main argument of the paper was in favor of pubiotomy and condemnatory of the induction of labor. Personally, his experience led him to feel that pubiotomy would not retain a permanent place among operative procedures any more than symphyseotomy had. He predicted that, with some exceptions, in five years very few obstetricians would be doing pubiotomy. He thought Dr. Williams's objection to the induction of labor was largely theoretical, whereas those who had given it an extensive trial could not help but believe it was a most useful procedure and ought not to be condemned, but employed more frequently than it had been. This statement was made on personal experience, including more than 200 cases, and he had had a great many more cases since. Without any special prejudice in favor of one operation over the other, his personal experience had taught him that the induction of labor was an exceedingly useful, valuable and safe procedure, and with good hygienic conditions which could be obtained in the best hospitals and private houses, with good nursing, he did not have any infant mortality when done within three weeks of gestation, as contrasted with the induction of labor at term.

DR. HENRY D. FRY, of Washington, D. C., mentioned fifteen cases of pubiotomy without a maternal death, or he might have had twenty-seven cases without a maternal death, but this did not tell half the story. It was the morbidity rate. He began this operation with a great deal of enthusiasm, and said it was one of the most gratifying operations to do in obstetric surgery. In fact, so far as the operation itself went, it was ideal. It was an easy thing to do. There were certain accidents which might happen during the operation. In the first place, tearing the anterior vaginal wall during the extraction of the child's head. Owing to the fact that the bones are not supported properly, the stretching of the tissues tore the anterior vaginal wall. One was liable to rupture the plexus of veins and get hemorrhage. The speaker would never select pubiotomy in preference to Cesarean section, provided the woman had any chance, and he would give her that chance if she had been in labor twenty-four or thirty-six hours. He would rather do it provided forceps had not been used or any efforts at version made. He would rather do Cesarean section in such cases, believing that the mortality would be no higher than that following pubiotomy, and convalescence would be much better. A complication which followed these cases was septic phlebitis. In a series of twenty cases which he collected a year ago, twelve of them were primary, eight secondary, with four deaths in the second-

ary cases. If one could not do Cesarean section, then he might do pubiotomy, but he believed there was a limited field for it as a secondary operation.

DR. RICHARD C. NORRIS, of Philadelphia, said that he was rather disposed to take a more favorable view of pubiotomy than most of the gentlemen who had spoken. He had watched its development with a great deal of interest, and in a paper he had discussed it along lines similar to those pointed out by Dr. Williams. He would differ with Dr. Williams in regard to the attitude taken by him with reference to the induction of labor. The essayist had started out with a fetal mortality for induced labor of 30 per cent., whereas in thirty cases reported by the speaker in his own paper the primary mortality was 10 per cent., and of that 10 per cent. there were at least four cases, if he had the matter to do over again, which he would not have subjected to induced labor, but to pubiotomy.

As to preliminary dilatation, he would differ with Dr. Williams as to manual methods, preferring the Pomeroy bag method, as it was an integral and essential part of the operation of pubiotomy in primiparous women. In brief, while he was not an enthusiast beyond a reasonable degree for pubiotomy, he thought it should receive a more extended trial.

DR. WILLIAMS, in closing the discussion, answered in detail all of the points brought out by the different speakers.

OFFICERS.

The following officers were elected for the ensuing year:

President, DR. J. RIDDLE GOFFE, of New York.

First Vice-President, DR. HOWARD A. KELLY, of Baltimore.

Second Vice-President, DR. MALCOLM McLEAN, of New York.

Treasurer, DR. J. WESLEY BOVEE, of Washington, D. C.

Secretary, DR. LEROY BROUN, of New York.

Members of the Council: DR. GEORGE TUCKER HARRISON, of New York, and DR. J. MONTGOMERY BALDY, of Philadelphia.

New York was selected as the place for holding the next annual meeting.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Meeting of March 26, 1908.

WILLIAM S. STONE, M. D., *in the chair.*

AN ASEXUAL MONSTER. A UNIQUE SPECIMEN.

DR. EDEN V. DELPHEY presented what he termed a "microcephalic monocular octodigital octodactyl unirenal asexual monster," with radiographs of the same. The specimen was born on January 1, 1907, and lived three days and five hours.

The parents were German, strong and healthy, and there was nothing in the prenatal history which could be held as a cause of the malformations. The father was thirty and the mother eighteen years old. Although the confinement was at full term, the child was only as large as a six months' fetus. There was decided oligohydramnios, there not being more than a pint of liquor amnii. The head was small, measuring 24 cm. in circumference. The specimen was 37 cm. long and weighed 1,250 grams. The cranial bones were completely ossified. There was but one eye and the socket of the other contained apparently only connective tissue, but this would be determined when the autopsy was completed. The right palpebral fissure measured 17 mm. and the left 14 mm. The nasal processes of the supra-maxillary bone and the nasal bones were hypertrophied and separated in the median line. There were but four fingers on each hand and four toes on each foot. Both hands and feet were symmetrical. There were no external genitals of any kind. There were two ovoid elevations, just over the site of the external ring, which were about the size of an almond. These were empty cyst sacs, the nature of which had not yet been ascertained, but which he hopes microscopical studies will demonstrate. The pouch, which somewhat resembled a scrotum, was entirely a post-mortem change, the loose connective tissue being distended by intestinal putrefaction and the bacillus *aerogens* with which it became infected post-mortem. The anus was patulous and in the anterior margin a dimple showed the location of the urethra. A partial autopsy disclosed the fact that all the internal organs were normal except that there was but one kidney and no internal sexual organs whatever. The specimen, so far as he could discover, was the only "neuter" or asexual human being ever presented to a scientific body. (A full description will appear later.)

DR. HERMAN J. BOLDT presented a number of specimens of

CARCINOMA OF THE VAGINAL PORTION OF THE CERVIX.

The principal reason why this uterus was presented was because a question of doubt as to the justifiability of having done an extirpation of the uterus arose in his mind after the pathologists' report had been received. Clinically, there was not an iota of doubt in his opinion as to the breaking down ulceration present on the vaginal portion of the cervix being malignant. The patient, a woman advanced in the forties, had been having a typical bleeding and putrescent vaginal discharge for several months. The ulcerated parts broke down very readily when manipulated upon bimanual examination, and especially so when a sharp curette was used prior to doing the radical operation. When he received a report that the ulceration was not malignant, he was surprised, and sent the same specimen to a pathologist of high repute and whose opinion was accepted as

unquestionable by all who knew him. That pathologist reported that the cervix was invaded with nests of epithelial cells of the squamous variety; in addition there was a decided necrosis of the endometrium and endocervix, beneath which dense infiltration with polynucleated leukocytes had occurred.

This again showed that a report from a pathologist was sometimes not reliable if the pathologist did not take the time to examine carefully.

ADENOCARCINOMA OF THE BODY COMPLICATED WITH SUPPURATIVE TUBO-OVARIAN INFLAMMATION.

M. L. has had atypical bleeding for several weeks after having been curetted. An examination of the scrapings showed adenocarcinoma. The operation was done by the abdominal route because of its easier access from that direction, since the annexa were extensively affected by an inflammatory process. Patient made an uninterrupted recovery, she was out of bed the day following operation, and likewise every day thereafter.

TWO UTERI REMOVED BECAUSE OF PERSISTENT BLEEDING.

Both patients had had profuse uterine bleeding at times, and were never free from some loss of blood; the various kinds of treatment employed had been ineffectual. In one, the woman of forty-four years, the scrapings were sent to the laboratory and an immediate report obtained from frozen sections made. The report was that the picture was suspicious of malignancy. Subsequent examination of the specimen disproved this. The blood-vessel coats of both uteri showed pathological thickening, otherwise the changes of chronic metroendometritis. The ovaries in both cases show chronic inflammation.

PLACENTAL POLYPUS.

For three months subsequent to confinement the woman from whom the specimen was removed had more or less profuse uterine bleeding. The attachment of the tumor was to the fundus of the uterine body. The suspicion was that it might be a deciduoma, but the pathological report from the practitioners, laboratory did not confirm the suspicion. Within two days after removal of the placental polypus the bleeding entirely ceased.

The remnant of placenta which was as large as a large hen's egg must have remained adherent to the interior, while the larger part of the placenta detached itself.

The patient from whom this second placental polypus was removed was told that she had carcinoma. She had aborted four months previously, and since then had been bleeding more or less profusely.

TUMOR OF THE ROUND LIGAMENT.

DR. HERMAN J. BOLDT presented this specimen. F. L. had for some time an enlargement in the right inguinal region which was diagnosed by her physician to be a hernia. She was admitted to his service in one of the hospitals with which he was connected for an operation on the pelvic organs, at the same time she requested to have the swelling in the groin which had become troublesome attended to. No definite diagnosis was made.

On cutting down, the small tumor presented itself, which when followed in its course was continuous with the ligamentum teres. The cyst wall was composed of fibrous connective tissue, loosely held together. In the meshes of the connective tissue were masses of leukocytes. The lining of the cyst was of fibrous tissue. The vessels were few in number.

TUBAL ABORTION.

Some questions that were asked him when operating upon the woman from whom this specimen was removed, induced him to present it, although there was nothing of unusual interest to be seen in the specimen. The woman was admitted during the night, and he was informed that an abortion had taken place two weeks ago; that since then she had been continuously bleeding. Her pulse, the house surgeon said, was feeble. He wished to know whether she should be curetted. He told him that from the few words that he said, the condition looked more like an extrauterine pregnancy, but that she should be kept quiet, get some stypticin internally, and be watched; he would see her in the morning.

When he saw her in the morning the woman was completely blanched, entirely pulseless, but in possession of her mental faculties. He made a rather superficial examination, determining only that the vaginal portion of the cervix was not succulent, and that the uterus was not enlarged or softened in consistency, and that the woman complained of severe pain when the vaginal portion of the cervix was moved forward. This was a symptom that he had observed for a number of years, and had learned to attach some importance to it. He did not know of anyone who has called attention to it besides himself. The pelvis was filled with an indefinite fullness, which made the impression upon him as being fluid and coagulated blood. The fallopian tubes could not be palpated. It was ordered that the woman be immediately prepared for operation. It was useless to wait for an improvement of the pulse, because instead of improving since last night the condition had become more critical. No hemocele had formed, although from the history it was likely that intraperitoneal bleeding had begun two weeks ago. The operation occupied but a few minutes. The abdomen was filled with blood which gushed out like from a fountain, as soon

as an exit was made for it. It was evident that the left tube was the seat of the faulty implantation of the ovum, and it was removed. In this instance the ovary was removed for the purpose of studying it histologically.

The readily accessible large blood-clots were removed, and while closing the abdomen saline solution was poured into it and left in it for absorption. In addition an intravenous infusion was made.

The questions that were asked are: Is it ever desirable to delay operation in extrauterine pregnancy if the pulse is very poor. Answer: Yes, in exceptional circumstances. Can the diagnosis between tubal abortion and tubal rupture always be made? Answer: No, not from the clinical symptoms. Does an hematocele always form, if tubal abortion occurs? Answer: No. In this case the symptoms were just as serious as they are in an extensive tubal rupture, and death would undoubtedly have taken place from acute anemia had the patient not been promptly operated upon. Does death ever take place from intraperitoneal hemorrhage because the operation for the removal of the gestation products has been delayed? Answer: Yes. He was aware that some doubt this, but he had seen three such instances. One, a patient referred by Dr. A. Seibert a number of years ago. The diagnosis of extrauterine pregnancy was made, and the patient was sent to the Post-Graduate Hospital. He intended to operate on the following morning. During the night he was sent for because the woman suddenly went into collapse. By the time that he arrived and had made arrangement for operation, she was dead. An extensive tubal rupture had taken place into a preformed hematocele, and broken through into the peritoneal cavity. Confirmed by autopsy.

Another case seen by him in consultation with Dr. Louis Peiser, in which the diagnosis was thought to be colic from indigestion or appendicitis, was diagnosed also by him as tubal pregnancy. Immediate operation was advised, but before the patient and her husband had come to a conclusion whether to sanction it, another hemorrhage occurred and the patient died. A third instance was in his mind, but he did not recall the exact particulars at this time.

Dr. WILLIAM S. STONE corroborated what Dr. Boldt had stated in regard to the patient complaining of pain when the vaginal portion of the cervix was moved forward in these cases of tubal abortion.

Dr. C. C. SICHEL reported a case of ectopic interstitial gestation in which death from hemorrhage followed a rupture. He believed that death might have been averted had immediate operation been done.

Dr. CHAS. F. ADAMS reported the case of a woman who was brought to the operating room with practically no pulse. The use of saline infusion brought the pulse up and she rallied to a

very marked extent. He believed she would have died if the saline infusion had not been given. She had a ruptured right ectopic and a left hydrosalpinx, both of which he removed.

DR. BOLDT said it was better to begin the infusion when the patient was first placed on the table, and not to wait until the completion of the operation.

DR. ADAMS said this was what was done in the case he reported.

CARCINOMA OF THE UTERUS COMPLICATED BY PUS TUBES AND ADHERENT APPENDIX.

DR. C. C. SICHEL presented this specimen. The patient from whom he removed the specimen was forty years old. The diagnosis was cancer of the uterus and operation was pan-hysterectomy and appendectomy. The family history was negative. She had an attack of what she called inflammation of the bowels five years ago, and she was sick one month at that time. The history of her condition was rather indefinite. She probably had an attack of appendicitis or salpingitis. Her menses started at the age of fourteen and were regular. The menopause had not yet been reached. She had been married six years, had two children but no miscarriages. On June 1, 1907, the patient began to lose weight, and complained that she did not feel well. About August 30, a week before she was admitted to the hospital she had a fainting spell, from which she quickly recovered. Since then she became worse and worse. She had a vaginal discharge, with odor, since June; this was more profuse at the time of her menses. There was no bleeding. The abdomen was distended. There was pain on pressure in the lower right quadrant. She had a slight umbilical hernia. Upon examination the cervix was found to be enlarged, bleeding readily. There was a foul smell. There was a whitish, elevated area which felt hard to the finger. The tissues did not break off easily. The uterus was bound down with adhesions, but was slightly movable. She was admitted to the hospital September 8. A specimen from the cervix was sent to the pathologist who reported back that it was an adenocarcinoma. On opening the abdomen the tip of the appendix was found to be adherent to the right ovary. The appendix was removed and showed an old catarrhal condition. The tubes were enormously distended and bound down by adhesions. A pan-hysterectomy was performed and the abdomen drained. The patient's condition became critical while on the table and a saline infusion was given along with strychnine and whiskey hypodermatically. For several days the patient remained in a critical condition, but recovered.

RIGHT OVARIAN CYST COMPLICATED BY APPENDICITIS AND DISTENDED GALL-BLADDER.

DR. C. C. SICHEL reported this case. The patient was twenty-seven years old, a general houseworker, colored and married.

Her previous history was negative. On the afternoon of September 30, 1907, she was suddenly seized with sharp, stabbing pain in the abdomen; this pain was accompanied by a severe chill and fever, lasting about four hours. This condition passed off, but a second attack occurred on October 1, in the morning, lasting twenty-four hours. On admission to the hospital, October 2, she complained of pain and tenderness, as in the previous attack. Her temperature was 99, pulse 100 and respirations 32. There was some rigidity but no tympanites. There was considerable pain over the right side of abdomen. The vaginal examination disclosed a small mass on the right side. A diagnosis was made of a small cystic ovary complicating appendicitis. An incision was made in the right rectus. A slightly cystic ovary was found on the right side; this was removed. The appendix was found to be swollen and congested, with few adhesions, and was removed. The gall-bladder was found distended and very tense. An incision was made along the border and parallel to the right ribs over the gall-bladder. On examining it, considerable of the tension was overcome, and as no stones were felt he closed the abdomen. The patient made a complete and rapid recovery. The examination of the blood prior to operation showed a slight leukocytosis and an increased polynuclear count. The patient made an uneventful recovery and left the hospital on the tenth day.

DR. EUGENE C. SAVIDGE called attention to the fact that in the report of the first case Dr. Sichel said that the patient began to lose weight June 1, and entered the hospital September 1. This had a direct bearing upon the paper of the evening.

CASE OF INVERTED APPENDIX, RE-OPERATED, WITH MICRO-PHOTOGRAPH.

DR. HENRY DAWSON FURNISS presented this specimen

The patient from whom this appendix was removed was a woman forty-five years of age. Six years ago she had an abdominal section when plastic work was done on the tubes and ovaries and the appendix inverted after the method of Edebohls. Two years ago he did a cecostomy for mucous colitis in order that the whole of the large intestine might be irrigated. The operation was done in the same manner as a Kader's gastrostomy, the cecum being sutured to the parietal peritoneum, and a permanent catheter being left in the cecal opening. On December 23, 1907, to close the fistula, he cut down to the cecum, separated it from the abdominal wall for an inch around the opening, the edges of which were then freshened. At the lower angle of the cecal opening was the appendix, projecting three quarters of an inch into the cecum; this with its base was removed and the cecal fistula closed. The microscopical section of the appendix showed nothing abnormal other than the inversion. From without inward was seen the mucous membrane, the sub-

mucosa, with lymphatic tissue and lymph nodes in places, circular muscular layer, longitudinal muscular layer, and in the centre a "core" of fibrous tissue. The blood-vessels are in the submucosa, but were more numerous and larger in the inner fibrous "core," representing the serosa and subserosa. It was claimed that often a portion of the appendix in these cases sloughs away, leaving a stump of from a quarter-inch to more in length. Unfortunately, no longitudinal sections were made of this specimen to determine whether it was a stump or only an appendix shortened longitudinally.

From the clinical history of the patient, he did not think that the inversion of the appendix had anything to do with the mucous colitis, for the colitis was present before the appendix operation and was no more severe afterwards. As the colitis had almost cleared up at the time the appendix was removed (second operation), it could not be said that the excision of this organ had any bearing on her subsequent history.

DR. JOHN O. POLAK had seen a number of cases of colitis subsequent to the operation of inverting the stump of the appendix.

DR. FURNISS did not believe there was any relation at all between the inversion of the stump and the mucous colitis.

DR. CHAS. F. ADAMS reported a case of amputation of the cervix under hypnosis. The patient was forty-six years old, married, and had three children. Her last child was born ten years ago. The first two confinements were normal and fairly easy. The third was hard and from that she dated her trouble. She had headache, referred principally to the occiput, and some backache. She had profuse leucorrhœa. Examination revealed a stellate tear of the cervix, very deep on the posterior lip, and extending directly backward, the appearance suggesting malignancy. The cervix was amputated under hypnosis. The patient felt no pain whatever. Dr. Adams noticed that there was less relaxation of the parts, and more hemorrhage under hypnosis.

Upon further questioning, Dr. Adams acknowledged that he had but little faith in hypnosis; at the same time he was surprised that the patient could be under the knife for one hour and yet experience no pain whatever. In order to test the sensibility, he thrust a needle into her perineum once or twice, but she did not flinch. Hypnosis was applied by Dr. Leonard one-half an hour before operation and during the operation he stood at the patient's head and mumbled to her, "You feel no pain; you feel no pain."

DR. HENRY DAWSON FURNISS two years ago had a patient, a young, undeveloped girl, with persistent vomiting while awake. In twenty minutes he was able to put her to sleep by suggestion, and he kept her asleep twenty-one hours out of twenty-four. He then taught the members of the family to successfully use hypnosis. This patient had a cyst of the ovary and Dr. Edebohl, Dr. Polk and others were able to examine her while she

was under hypnosis without giving her any pain whatever or causing any spasm. After she was operated upon she developed a cystitis. Under hypnosis she was cystoscoped, the ureters were catheterized and without pain. Dr. Furniss had employed hypnosis in two other patients with success, but he had failed in others. He said, regarding the hemorrhage in cervix operations, that he had gotten absolute hemostasis by the use of 1 to 6000 adrenalin solution injected under the mucous membrane covering the area he intended dissecting, using less than forty minims.

THE CANCER PROBLEM.

DR. EUGENE COLEMAN SAVIDGE read this paper. He said that all would probably agree with the following statements regarding the condition popularly known as cancer. First: "It must be confessed that in spite of the time, brains, energy and money which have been expended during the past few years in the attempt to solve the problem of cancer in almost all parts of the civilized world, little or no apparent progress has been made." (Editorial, *New York Medical Record*, June 29, 1907.) Second: That researches as to cancer cause based on bacteriological transmission have yielded no result. Therefore, nothing could be expected from either antiseptic or antitoxin treatment. Third: That even if the theory of wandering cells from embryonal life were capable of proof, such proof would give us nothing of value in treatment. We could never penetrate fetal life and anchor the displaced or wandering cell. Fourth: That though surgery had done thoroughly clean work, at least in uterine cases, it had been followed with prompt recurrence and speedy death. They must necessarily hold that their present resources were unsatisfactory, and that their position was one of "hopeful expectation." Notwithstanding these statements, Dr. Savidge believed that there were signs of promise important enough to merit studied consideration. We had an indication of the cancer cause and a sane hope regarding the successful treatment of cancer. This indication, which became more conclusive the more one studied it, lay in the physical variation in the isomeric quality of the primitive elements entering into the composition of protoplasm. The hope of successful cure lay in the restoration, or the preservation, of certain ferments the secretion containing which seemed to be altered, or abolished, long before the human organism reaches the state of cancer. He doubted if the cancer problem would ever be solved by the application of a juice to a spot, or even the hypodermatic application of a ferment to the organism. Dr. Savidge then considered in outline Pasteur's great work on fermentation and its connection with cancer. The importance of the ferments of the body, called here digestive and including the opsonins of the blood, was becoming clearer to the profession. They were elements

of assimilation and agents of protection. Certain ferments in the blood make the germ vulnerable to the phagocyte, thereby assisting these latter to digest specific infections in the blood. He reported a perfectly well authenticated opsonin cure of malignant tertiary syphilis of the most extreme type. A miner, afflicted with ignored syphilis, untreated until its malignancy crippled him, was stricken with smallpox. The recovery from smallpox left him permanently cured of his tertiary syphilis. The explanation of this then was that the smallpox germ had killed the great pox germ. The explanation was now simpler. The stimulation of the opsonins by the acute infection brought a collateral stimulation of the opsonins of syphilis and this ferment caused the cure of the man of a disease incurable in him at that time by drugs. Dr. Savidge said that he had long pondered over the fact that cancer was locally but an exaggeration of normal cell tissue as seen by the microscope. As the isomers might be defined as "the difference between the same thing," so cancer might be called an isomer of normal tissue. That they did know a force that would cure some cancers and cause some cancers he believed would be denied by no man in the profession. That was one thing known. A second thing known was the action of these forces upon the ferments. They also knew that the sun, the x -ray and the radium ray both cured and caused disease, and each acted significantly upon the ferments. Proven beyond all cavil, however, was the existence of this occult force which brought both hurt and cure. They knew that it acted on the ferments; they knew that ferments destroyed one isomer and allowed the other to remain untouched; they knew then that it thus acted at least once removed on isomers. They knew what the force did, pro and con; but they had not yet succeeded in bridling it so that it would always act pro and never con. This might be their next success when they had learned its relation to isomeric integrity. But that one known force could thus act pro and con presupposed that other forces might so act. If the asymmetry of the carbon atom caused one form of the same thing to assume a right rotary quality and another a left rotary to the polarized light; if one of these qualities was assimilable under our digestive ferments, was acted upon by our protective ferments, and the other was not; if the cell proliferation of cancer was simply an exaggeration of normal cell proliferation, either of opposite isomeric quality, hence insusceptible to our ferments; or of the same quality, and undisciplined by our ferments because impaired—then, whatever deflected our protoplasm from one isomer to its opposite, or impaired the quality of our protective ferments, might be said to be the cause of cancer, long before its local manifestation. And whatever deflected this malign isomer to its benign opposite, or whatever restored the integrity of the failing ferments, long before the local manifestations, might be said to be the cure of cancer. If the radial forces—the sun, the x -ray and radium—even

if not acting directly upon the carbon atom in our protoplasm, acted repressively on our protective ferments, thereby allowing the wrong isomer to flourish into exaggerated cell life, then the radial force might be said to cause such a cancer. If pigment absorption, hair graying, hemoglobin disappearance, allowed the radial force to attack the cancer opsonin in the thus uncurtained blood-cells, then here was a more remote cause of cancer. Conversely, if they could shield our protective ferments from the destructive radial forces and at the same time expose our noxious elements thereto, the radial forces might be said to cure such cancers. If a perverted thyroid, withdrawn from its mysterious guardianship against wrong isomers, left them to flourish, then perverted thyroid was another cause of cancer. And, conversely, the restoration of such a thyroid was the cure for cancer so produced. But whether one item, or all, whatever restored glandular activity, replaced the disturbed ferment protection, restored the isomeric integrity, that item, or aggregation of items, thereby cured the cancer. The incipient cause, the study of the march of antecedents, the application of the cures, all lay in the domain of synthetical medicine. The conception of making an element in a man's blood eat up his own disease probably pointed to the line of future march. The following points were offered:

First.—Who had seen cancer develop in patients that had been under observation, say a year before the cancer became unmistakable?

Second.—What had been the relation observed between the cancer and the cachexia? What observations had been made of the various secretions? When did the glands begin to fail? When did the loss in weight begin? etc.

Third.—This question was presented with an avowal that no desire existed to discredit surgical methods. Restricting the question to uterine cases, what was the honest conviction of those with the experience regarding the quick and possibly more virulent return of the malignancy after operation? He said that perhaps those who operated most frequently were the least qualified to say how long life might have lasted without an operation, as they did not know this side. The excellence of their equipment in one direction was the measure of their limitation in the other. Yet the strictest estimate was necessary on this point, for if there was anything in the new trend, surgery might be the worst thing to do to a cancer. As the potato, which would grow but one plant as a whole, but subdivided grew a plant for each eye, so cell segmentation, by sowing parts each capable of reproducing the whole, might be simply spreading elsewhere the local manifestations.

Starting with a frank admission that nothing as yet had been accomplished, still clinging to the best methods of procedure of surgery, he asked if there was not reason to consider this sequence with scientific openness of mind. A certain known, but not

understood, radial force could act upon products containing the asymmetrical carbon atom to change their isomeric quality as shown by polarized light. That one force could so act presupposed other forces might so act. The natural ferments contained in the secretions of the body, digestive and protective, "digested" one series of isomers and left the opposite series untouched. Therefore, the action of this occult "radial" force, this assailing of isomeric integrity, could change protoplasm from digestibility to indigestibility to the natural ferments, and *vice versa*.

The local cancer product consisted presumably of changed isomers allowed to grow instead of being "digested." This was made all the more probable by the disappearance of the opsonic ferments in the blood in all such diseases as had been subjected to controlled observation; and, specifically in cancer, by the gradual suppression of the enumerated ferments. These ferments, presumably, began to modify long before transition from the preliminary to the final state called cancer. Therefore, even if there was no change in isomeric quality, the secretion suppression would explain the growth of the cancer weed cells that effective ferments would have removed. He closed by saying that if there was no flaw in these significances, the cure for cancer as well as its prevention lay in the realm of synthetical medicine.

DR. DELPHEY said that when the living body was subjected to the action of radio-activity either from the "x-ray" or radium, the cells whose equilibrium was most unstable were the ones first and most acted upon. These cells were in the stratum granulosum of the skin, the endothelia of the blood vessels, the leukocytes, the cells of the glandular system, the cells of the nervous system and those of neoplasms. This effect is produced in three different and distinct stages: stimulation to increased normal metabolism; stimulation to erratic neoplastic growth; and over-stimulation to death and disintegration of tissues, either microscopical of en masse. One reason why the "x-ray" has failed in the treatment of deep-seated neoplasms is that while it might destroy the superficial portion, at the same time, because the radio-resistance of the tissues weakened the effect of the rays, the deeper parts were stimulated to increased malevolent growth. As radium is inserted directly into the body of the neoplasm and its action is directly from within outward toward the circumference, and as it has a selective action upon the erratic cells, better results may be hoped for and obtained, provided the dosage can be so adjusted as to destroy the malignant cells and not stimulate the normal to erratic neoplastic growth.

DR. HERMAN J. BOLDT said that Dr. Savidge seemed to be under the impression that cancer was a systemic disease rather than a local one. If carcinoma was a systemic disease it was difficult to understand how these sufferers were to be cured. If cancer was attacked in the early stage surgically, a cure might

be expected in many cases. Cachexia was a preliminary stage of cancer and he said that he had yet to see a single case of marked cachexia and the patient operated on successfully. There was not a single instance on record of the cure of cancer by operation when cachexia was present because of the neoplasm.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of February 7, 1908.

The President, I. S. STONE, M. D., in the Chair.

DR. G. BROWN MILLER reported a case of

PYONEPHROSIS PROBABLY ORIGINATING IN PREGNANCY.

Mrs. A., age forty-eight, a patient of Dr. Harry Parker, was referred to me August 9, 1907. She gave the following history: Twenty-three years ago, two weeks before the birth of her last child, she began to suffer with pain in the left side and with fever. She says an abscess which had formed about the ovary burst into the vagina two hours after the delivery. A purulent vaginal discharge kept up for two or three years. From time to time ever since she has had paroxysms of intense pain in the left side in the region of the kidney. Pus was noted in the urine first about eight years ago, but the urine has been noticed to be more cloudy after the attacks of pain. She has not had chills or fever during attacks, nor has she noticed any connection between them and the intestines. Any unusual exertion will bring on an attack. She has been compelled to take morphine to relieve pain and has acquired the habit, taking about eight grains a day hypodermically. She now gets up about three times a night to urinate and has some frequency during the day. Menopause occurred several years ago.

The pelvic examination shows the genitalia atrophic, with no sign of any inflammatory process.

The cystoscopic examination shows the bladder mucosa pale-looking. There is no reddening, no other sign of inflammation and no scar or abnormal opening into the bladder. The left ureteral orifice appears large, pouting and slightly inflamed-looking, and purulent urine can be seen escaping. August 13. After bladder irrigation, the left ureter was catheterized, a large catheter being used, and no obstruction being met with. In a few minutes there ran from the catheter six ounces of urine with specific gravity 1006, much pus, heavy trace of albumin and urea four grains to the ounce.

The mixed urines contained less pus, seven grains of urea to the ounce, and had a specific gravity of 1010.

September 10. The right ureter was catheterized after bladder irrigation. Clear urine escaped in a normal manner from the catheter. The urine proved normal.

The left kidney was removed October 23, after an attack of severe pain lasting more than a week. The kidney was about eight inches long and was markedly dilated. No marked difficulty was experienced in removing it. About five inches of the markedly dilated ureter was removed with the kidney. A small amount of pus in the urine continued for some time, but there has been no sign pointing to any infection of the other kidney.

The histological examination showed no evidences of tuberculosis.

DR. HENRY D. FRY, reported a case of

OBSTRUCTIVE JAUNDICE, CHOLECYSTITIS, CHOLECYSTOTOMY.

Mrs. D., aged sixty-two years, mother of nine children. Has had typhoid fever, scarlet fever and pneumonia.

First noticed attacks of pain in side and abdomen about one year ago. She thought they were due to acute indigestion, but noticed a reddish color to the urine and suspected that her liver was at fault. After several attacks she became jaundiced.

November 18, 1907, she had an acute attack and suffered intensely for several hours. Became much jaundiced. Had frequent recurrences of pain about once a week until January 16, 1908.

Dr. Fry saw her at her home near Bethesda, Md., January 22, nausea, vomiting and pain; chilly sensations; temperature, 102. Stools and urine characteristic of obstruction of bile. Jaundice intense. Next day temperature reached 103. She was brought to his private hospital, January 24.

Leukocytosis, 28,000; urine, 5 per cent. albumin; no casts; mitral insufficiency.

Operation, January 25. Abdomen opened and gauze protective sponges applied. The gall-bladder ruptured at the fundus in bringing it forward and about 50 c.c. of mucopurulent fluid escaped. A small stone was removed from the bladder and a larger one milked from the common duct, and removed by spoon curette passed through the tear in the gall-bladder, drainage-tube inserted into the gall-bladder and cigarette gauze drain inserted.

Patient returned to bed in good condition. Second day, no fever; third day, highest temperature, 100.6.

Drainage from gall-bladder amounted to 200 c.c. the first twenty-four hours, and then rapidly diminished. Drainage-tube came out on twelfth day. Gauze drain removed on fourth day.

Bowels moved on the third day from salts; color of evacuation, yellow. Jaundice cleared up rapidly, and patient made good convalescence.

DR. BOVEE, in discussing Dr. Miller's case, thought that the case would have been one for flushing of the pelvis of the kidney rather than for nephrectomy. In regard to the tying of the ureter, he considered such a procedure unnecessary if the ureter was not a suppurating surface; for there would be no regurgitation of urine from the bladder to infect the tissues.

DR. STONE considered it advisable to ligate the ureter to prevent infection of the tissues, even when the ureter was not distinctly suppurating or tubercular.

DR. MILLER said that at the time of removal the kidney had looked much worse than after its preservation in and contraction by the alcohol. That on incision of the kidney about six ounces of purulent urine had escaped, that the patient had had severe pain for a week and more or less pain for twenty-three years, that microscopical examination of the kidney had shown that only about one-fourth of the normal tissue was left. He did not think that this case was suitable for irrigation of the pelvis of the kidney, as the ureter had not been the primary seat of the trouble. A nephrotomy with drain might have helped, but final nephrectomy would have been necessary. He tied the ureter to keep it from infecting the tissues until it had become emptied of the pus that it already contained.

DR. MILLER, in discussing Dr. Fry's specimens, asked if the gall-bladder had been necrotic, as he had seen similar cases in which the gall-bladder had been necrotic.

DR. THOMAS asked when the patient had had typhoid.

DR. STONE interpreted the small size of the stone blocking the cystic duct as showing that the duct itself was not much dilated and the condition of short duration. That the symptoms of great pain associated with jaundice was seen also in inflammation of the hepatic duct and similar pain even with ulcer of the stomach. That the pain was consistent with the presence of normal ducts.

DR. BOVEE said that complete obstruction of both ducts was uncommon. He did not believe in cholecystectomy and had never done the operation; that, so far as he knew, none of his cases had recurred. That the objection to cholecystectomy was the difficulty in cases where second operations were needed for trouble with the remaining ducts. In one case recently, adhesions between gall-bladder, omentum and intestines had been so misleading that he had mistaken the condition for one of kidney trouble.

DR. CARR thought the gall-bladder ought to be saved unless the indication for its removal was very clear, as in cases of cancer.

DR. KELLEY mentioned a case of empyema of the gall-bladder, with a clear, white fluid and white stones. A case, also, which, under medical treatment, had taken, as she said, two barrels

of olive oil, and yet autopsy showed a stone the size of a pigeon's egg in the cystic duct.

DR. STONE asked what treatment would be indicated when the cystic duct was occluded.

DR. CARR admitted the indication in Dr. Stone's case for cholecystectomy.

DR. FRY, in closing, said that his patient had had typhoid many years before and that he had not considered it an etiological factor. The diagnosis here had been made on the violent pains, with bile in the urine and jaundice in repeated attacks perhaps once a week associated with fever, rigors and tenderness over the gall-bladder. That the gall-bladder had been friable, but not necrotic. That the stone had been located at the beginning of the common duct which was sacculated and the stone acted like a ball-valve. That, therefore, he had considered the condition one of long duration.

Meeting of February 21, 1908.

The President, I. S. STONE, M. D., in the Chair.

DR. GEORGE TULLY VAUGHAN presented the specimen from a case of

CHOLELITHIASIS—CHOLECYSTECTOMY.

Mrs. W. F. H., white, aged forty-eight, was admitted to Georgetown University Hospital, February 10, 1908. She was a large, fleshy woman and gave a history of jaundice fifteen or twenty years ago, which laid her up some time. She finally recovered and has not had jaundice since, but has been troubled with "indigestion," more or less, ever since. For four or five months this trouble has increased, the patient having pain in the epigastrium, right hypochondrium and right side of the chest, sometimes also in the left hypochondrium; chilliness; pain; constipation; and for the last four weeks vomiting daily, the least solid food and sometimes liquid food being followed by vomiting. No sign of jaundice. On palpation, tenderness is found on deep pressure in the right hypochondriac region; also on the left side, but not so marked. Diagnosis: chronic cholecystitis, probably with the presence of calculi.

February 11. The abdomen was opened by a straight incision through the right rectus muscle. The gall-bladder was found almost completely filled by a large stone. The common duct, the stomach, duodenum and pancreas were examined, and nothing was found abnormal about them. It was decided to remove the gall-bladder, as it was evidently the seat of chronic inflammation, and its retention might lead to recurrence of inflammation or the formation of painful adhesions. The common duct was undoubtedly open. So the gall-bladder with the stone were removed by clamping the cystic duct with

hemostats, ligating the duct a little beyond the hemostats, cutting between ligature and hemostats, then dissecting off the gall-bladder so as to have flaps of peritoneum, which when sewed together with catgut, covered the exposed liver surface. Abdomen closed without drainage. Recovery without trouble, except for gaseous distention of the bowels during the first three days after the operation. The stone is quite large, measuring two inches in length, three and three-fourth inches in circumference, is pear-shaped, of dark brown color, and is covered with minute crystals which sparkle like diamonds.

DR. BOVEE said the stone, in size, shape and appearance, was very similar to one that he had secured several years ago from the wife of a physician by the use of large enemata, with the patient in the knee-chest position. She had had intestinal obstruction for four days, the attack coming on suddenly while she had been in good health. On the day following the passage of this large gall-stone she was walking about the house. He had never removed a gall-bladder, nor had he ever lost a patient in marked suppurative cases of the gall-bladder with the complication of perforation. He had never been obliged to reopen the abdomen after a gall-bladder operation nor been given the opportunity, after the lapse of some time, to explore either the gall-bladder or the peritoneal cavity, and therefore was not in a position to state that any function of the gall-bladder remained; yet by analogy, he believed the function of the gall-bladder not to be completely ended by suppurative cholecystitis and drainage. He was inclined to think that a fairly good-size and practically normal bile reservoir remained.

DR. LEWIS thought that after a gall-bladder had once been operated on and drained it was just as useless as if it had been removed.

DR. STONE had seen intestinal obstruction in three cases due to stones with a gall-stone nucleus. He did not think that stones of such great size ever perforated from gall-bladder or ducts into intestine, but that secondary deposits were made in the intestine. He believed in doing cholecystectomy in appropriate cases though neither that nor drainage of the gall-bladder would be effective in all cases. In one case of rupture of the gall-bladder he had done an operation with drainage and some time later a cholelithotomy for gall-stones, and five years after that had to do a cholecystectomy. At this last operation the gall-bladder had been free from all adhesions even those of the previous operations, but the cystic duct had been completely occluded. The primary objection to cholecystectomy lies in the difficulty of treatment in case stones form later in the liver or other ducts. He had one case in which there had been no gall-bladder, and yet the hepatic duct was full of stones. In cholecystectomy the operator should probe both hepatic ducts and the common duct and be sure that no stones were left behind. He asked, what would be the propriety of ligating the cystic duct

and closing the abdominal incision? He had had one case in which he had ligated the cystic duct with twenty-day chromic catgut and drained the gall-bladder, but after five days bile was flowing from the drainage-tube, showing that the cystic duct was already patent.

DR. SHANDS had recently seen a case with a stone nearly the size of the one Dr. Vaughan showed. In his case the liver extended into the pelvis, the gall-bladder being located at the usual site of the appendix.

DR. VAUGHAN, in closing, said that he did not believe in cholecystectomy unless absolutely necessary. In this case he thought that the long duration of the disease made a less extensive operation the choice, and he expected to do later a cholecystectomy. He did not know whether or not the gall-bladder functionated after it had been drained. That gall-stones were formed in all parts of the liver was well authenticated, so that he thought it desirable to leave the gall-bladder *in situ* when in doubt as to what should be done with it. In one case he had seen the common duct dilated so that it held a pint of bile.

DRS. GILL AND I. S. STONE reported a case of

ECTOPIC GESTATION WITH ATYPICAL SYMPTOMS.

Mrs. J., white, had one child and several miscarriages. Her health has generally been good and she has never had any serious pelvic or abdominal disease. She missed her usual period, which was due December 23, 1907. During the month of January, 1908, she had an irregular, shreddy flow which at times was profuse, but without pain until January 22, when she had a distinct attack of pain in the pelvis and right side of the abdomen and also in the left shoulder. Her physician (Dr. Gill) saw her at this time and made a tentative diagnosis of tubal pregnancy. He found her in a condition bordering upon collapse, with the usual appearance of hemorrhage and shock. Her husband reported having seen her faint during this attack, but she had been revived before her physician arrived. The patient apparently recovered from this attack and had no return of pain until January 29, when she was again seized with severe pain in the pelvis and left shoulder, and her condition grew alarming to her family. She experienced at least two distinct attacks of pain which may have been coincident with tubal rupture. The patient's condition indicated severe hemorrhage and a consultation was requested. We saw the patient together at 5.30 P.M., on the 29th, and found her in severe shock. Her pulse was then 120 per minute and her temperature normal. The skin was very white, and her pupils nearly normal or perhaps slightly contracted owing to the influence of morphia given for pain. Her mental faculties were not disturbed, however, and she gave a clear account of her illness in response to our questions. At this time the abdomen was rigid on both

sides, although rather more so on the right. We had no reason to suspect gall-bladder disease, although the pain extended along the entire right side of the abdomen. The presence of appendicitis was excluded for many good reasons, chief of which was the character of the pulse and the temperature. Pelvic examination was rather disappointing in that no distinct mass could be discovered. Instead of this, we found a soft, indefinite, or boggy something without outline or definition. This part of the examination was rendered difficult because the patient was apprehensive and her abdominal muscles refused to relax sufficiently to permit a careful examination. Dr. Gill was positive that the shoulder pain was associated with the rupture of the right Fallopian tube and the resulting hemorrhage. His colleague assented to this diagnosis with a mental reservation regarding the cause of the shoulder pain. This unusual manifestation of a reflex pain, while not hitherto unobserved, is in our experience unique. That it was a prominent symptom there can be no doubt. In character, the pain resembled a muscular location rather than that of a nerve or joint. There was pain on inspiration and not so much during passive motion of the arm. The presence of pleurisy was negatived by auscultation, and finally there was entire relief from all symptoms of distress about the shoulder when the operation was concluded.

The patient was promptly sent to the hospital and operation was done at 9 o'clock that evening. When the anesthetic was started we found that the patient's pulse had recovered tone, and the condition of the patient indicated marked improvement, which still further reinforced our opinion that we were dealing with a recurring hemorrhage. When the abdomen was opened we found a large amount of both fluid and coagulated blood, which confirmed our belief that our patient had been bleeding at different times during the previous week. The right Fallopian tube and ovary were tied off, and after the blood was sponged away the abdomen was closed in the usual manner without drainage. Her recovery has been absolutely uneventful.

DR. KELLEY did not think there was any advantage in the secondary operation, he had always found that his patients were improved not made worse by the operation. He had operated on only one case where the patient was still bleeding. The bad cases with the great loss of blood seemed to him the ones most in need of immediate operation and since they improved there seemed no urgent need of a delayed operation in the less serious cases.

DR. MILLER believed in late operations in the necessary cases. He thought that 90 per cent. of the cases stopped bleeding of themselves. He believed in waiting for a positive diagnosis and in some cases, as for instance, in the country where surgical aid was not convenient, he believed in keeping the patient quiet and waiting in hope that the hemorrhage would stop.

DR. STONE did not believe that Robb and Sampson, who were the chief advocates of this secondary operation, referred to the cases where surgical aid was not available, but to the cases in a hospital ward. Personally, Dr. Stone believed in stopping every hemorrhage that he diagnosed by the surest means at his command and not in trusting to bed and opium when ligation of the bleeding vessel was possible. He had lost two cases of ectopic pregnancy, one of them bleeding to death before anything could be done. If this case had been operated on earlier, she probably would have been saved.

DR. T. C. SMITH read the paper of the evening on

SOME CURIOUS CASES.*

DR. FRY was much interested in Dr. Smith's series of unique cases. The one which interested him most was the case of adhesion of the hymen to the cervix, which did not seem explicable except as due to extreme vaginal inflammation where both extremes of the vagina were inflamed and the extremes met.

DR. WALL had often wondered what had become of the cases of vulvovaginitis in children, and thought that the case referred to by Dr. Fry might be such a case. In a child, the shorter distance between hymen and cervix would have made the adhesion less remarkable by several inches.

DR. ABBE said that the case had appealed to him as possibly the residuum of a transverse septal malformation, which would account for the adhesions to the lateral vaginal walls and make the hymen-cervix inflammatory adhesion only half so far-fetched. The case of inversion of the uterus had recalled to him the only case of inversion that he had seen, one where treatment had been sadly neglected. The patient, a Pole, had been brought to Mount Sinai Hospital, New York, in a toxic condition with a sloughing mass protruding from the vagina. No history of pregnancy or anything else could be elicited from the patient or her friends. In the examining-room considerable of the sloughing material was cut away, but as it seemed to have no definite bounds, and vaginal examination failed to show anything that was recognizable, the patient was sent directly to the operating-room, given an anesthetic, the perineum washed off with soap and water (surgical cleansing was out of the question) and then clamps applied and the mass pulled down and cut off piece by piece until by and by it was recognized that a hysterectomy was in progress, and then the condition was diagnosed as adherent placenta and inversion of the uterus which had been treated expectantly with consequent gangrene of placenta and uterus. The woman was sent back to bed with the expectation that she would die either from her sapremia or from the peritonitis which seemed her due after invading the peritoneum and doing the hysterectomy without

*See original article, page 271.

as much precaution as one would ordinarily take for the most trivial surgical procedure. To the great surprise of every one, the woman never had a temperature above 100 and made a most uneventful recovery.

DR. SMITH, in closing the discussion, said that the society being without an essayist for the evening, he had seized one cornu of the dilemma and presented these odd cases.

Meeting of March 6, 1908. In Celebration of the Twenty-fifth Year of the Existence of the Society.

The President, I. S. STONE, M. D., in the Chair.

DR. JOSEPH TABER JOHNSON made an

ADDRESS OF WELCOME

to the friends of the society and spoke of the history of the society, its foundation as one of the first special societies in the District of Columbia, and of its having for one of its aims, in addition to that manifested in its name, the most desirable function of the encouragment of brotherly love.

DR. McMURTRY, of Louisville, spoke of the

PROGRESS OF GYNECOLOGY

from the early ovariectomy of McDowell to the modern perfection of pelvic surgery and emphasized the great danger arising from this perfection in that youthful practitioners, lured on by the perfect asepsis and technic of the hospital operating-room were doing operations without justifiable cause and tending to bring all surgery into disrepute and to fill the future with anxieties.

DR. KERLEY, of New York, spoke of

TUBERCULOSIS IN CHILDREN

with special reference to the modes of infection and management. Of the two usual methods of infection, the respiratory and the alimentary, the respiratory was common. He had been able to find a direct source of infection in the majority of the cases of tuberculosis at the Babies' Hospital, in New York. Pathologically, the condition in children was very similar to that in monkeys, and in the New York Zoological gardens the tuberculosis mortality among the monkeys had been reduced from 50 per cent. to practically zero, there having been not a single case of infection with tuberculosis in the Zoo since the cages had been sterilized and all old cases isolated and new arrivals quarantined if they showed any signs of tuberculosis. This, showed that in monkeys practically all of the tuberculosis was a respiratory infection. He believed that intestinal infection with tuberculosis was extremely rare. Northrup considered it possible in 2 per cent. of the cases in children, while Holt considered none

of the cases intestinal in origin. He thought that the most effective prevention of tuberculosis could be obtained not merely by the care of the milk, but by legislation and education against tuberculosis spitting drastically enforced. In the management of the cases the best results followed hypernutrition, especially with nitrogenous foods, and conservation of energy by prohibiting exciting and strenuous plays, and insisting on the children remaining in bed for a certain number of hours each day.

The meeting adjourned to a banquet at Raucher's which was followed by many excellent speeches. Among others, Dr. Norris, of Philadelphia, spoke of the importance of Obstetrics as the mother of all the departments and specialties of medicine and how prophylaxis in obstetrics would make gynecology obsolete.

The presidents of many of the sister medical societies responded to toasts.

Meeting of March 20, 1908.

The President, I. S. STONE, M. D., in the Chair

DR. ADAMS read a paper on

TWO CASES OF CEREBROSPINAL MENINGITIS TREATED WITH FLEXNER'S SERUM.*

DR. DONNALLY had had no personal experience in this method of treatment of the disease. The first case reported by Dr. Adams had been weak in diagnosis, but the fact that serum had been used previously would have tended to hide the diagnosis and yet to confirm it in that the case subsequently got well. In the second case, the late injection of the serum on the fourth day would not be so likely to recover. An *a priori* value of the serum was seen in the fact that the serum rendered the cerebrospinal fluid sterile. The value of the serum had also been seen in monkeys in which the disease, previously always fatal, had been cured in all but one of Flexner's series of cases by the use of the serum. Of other methods of treatment, lumbar puncture was useful not only for diagnosis, but for the relief of pressure. He understood that McEwen recommended lumbar puncture to reduce fluid whenever the skull percussion gave a characteristic tympanitic note. Hot baths also were valuable for their sedative effect.

DR. J. D. MORGAN believed that he was the first person in the District of Columbia to use Flexner's serum and that the patient had recovered. This first case was a white girl on his service at Garfield Hospital, eighteen years of age, suddenly taken sick November 20, 1907, admitted to the hospital five days later, and on the following day lumbar puncture was done and 30 c.c. of serum injected. In all twelve punctures were made and 180

*See original article, page 354.

c.c. of serum injected. On January 21, 1908, she was discharged cured. The second case, a boy, four years of age, entered the hospital February 19, 1908; received two injections of serum 15 c.c. each and was discharged cured sixteen days later. The third case was a white girl, six years of age, who entered the hospital March 13, was given 15 c.c. of the serum on the day of admission and had recovered, though she was still in the hospital.

DR. WILKINSON had seen seven cases in which the germ had been identified, including the three reported by Dr. Morgan. He said that there was always doubt of the diagnosis unless the germ was found. The injection had been followed by termination of the disease by crisis and reduction of the leukocytosis. He thought 30 c.c. of the serum too much to inject at one time. He thought that a clinical diagnosis with a turbid appearance of the fluid removed might warrant use of the serum even if the germs had not been identified by culture.

DR. E. L. MASON said that in the differential diagnosis of epidemic cerebrospinal meningitis from tubercular or some other forms that the mere cloudiness or presence of leukocytes in the puncture fluid was evidence sufficient to permit of the use of the Flexner serum, though the presence of the specific germs was, of course, the only positive evidence of the diagnosis.

DR. THOMAS understood that organisms grown from cerebrospinal fluid injected back into the same patient subcutaneously had been followed by a cure in most of the cases. The organisms thus injected did not cause the disease, though when injected into the spinal canal they did cause it.

DR. SOTHORON asked if any bad results had followed injection of the serum into the canal, as had been the case with the diphtheria antitoxin.

DR. COOK called attention to the difference in the effect of autoinoculation and the inoculation with animal serum.

DR. MORGAN said that, in addition to the three cases of pure cerebrospinal meningitis due to the diplococcus intracellularis, that he had had one case of mixed infection where, in addition to the diplococcus, the influenza bacillus had been found. To this case also he had given Flexner's serum, but the patient had developed hydrocephalus and died. However, both organisms had disappeared from the spinal fluid after the injection of the serum.

DR. ABBE called attention to the fact that lumbar puncture of itself is a very valuable therapeutic measure, as remarked by Dr. Donnally. Some five or six years ago, while he was on the medical service of Mount Sinai Hospital, in New York City, lumbar puncture had been the main factor of the treatment. Previous to its use, the mortality from cerebrospinal meningitis had been high, perhaps 75 per cent., but during the series in which he knew lumbar puncture to have been used the number of cures had been perhaps 75 per cent. The diagnosis in these cases was confirmed by the bacteriologist in most instances.

DR. MORGAN said that the statement of Dr. Abbe that 75 per cent. of the cases of cerebrospinal meningitis recovered eight years ago was most surprising, as he had understood from the health department that his case was the first one after positive culture that had recovered in Washington since records had been kept of these cases.

DR. ADAMS considered Dr. Abbe's statement most surprising. He had recently consulted a number of eminent authorities on the subject of lumbar puncture, among them Dr. Koplik, the physician in charge of the children's service at Mount Sinai Hospital, and they had one and all declared that lumbar puncture as a therapeutic measure was obsolete, useless and relegated long since to the past. As to the diagnosis in the first case that he had reported, he found cases with identical histories quoted by Flexner and so, as there had been no history of influenza, intestinal or other lesions, he had considered the case one of the true epidemic types, although the germs had not been isolated.

He thought that the danger of dosage was that, as in diphtheria, at first too small a quantity would be given. He noted the fact that occasionally dry punctures would be made and said that these could be explained by the fact that in some cases adhesions, formed, cutting off the fluid that existed in the upper part of the canal from the portion that was tapped by the needle.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Nonexistence of Pyelonephritis of Pregnancy—Bazy (*La Bull. Méd.*, May 1, 1908) advocates preventive treatment for pyelonephritis of pregnancy. He believes that pregnancy is not the cause of the condition which exists before pregnancy occurs, and that pregnancy is rather favorable to recovery from this complication. One should rather say pyelonephritis accompanying pregnancy than pyelonephritis of pregnancy. Pregnant women suffer from frequent and painful micturition, and the symptoms are laid to the occurrence of pregnancy, the urine not being examined until there is fever and hematuria. The pyelonephritis is then in an advanced stage of evolution. The author advocates early examination of the urine and of the condition of the ureters in all pregnant women. When signs of pyelonephritis are found, the patient should be placed in bed with diuretic drinks as a preventive and curative of the disease in the early stage.

Suprarenal Capsules in Nephritis of Pregnancy.—J. L. Chirié (*L'Obstét.*, April, 1908) has made a study of the condition of the suprarenal capsules in pregnancy complicated with nephritis. The suprarenal capsule is antitoxic and angiotonic in function. There exists, in all probability, a hypertrophy and hypersecretion

of these glands in pregnancy. In nephritis of pregnancy the same condition exists. The author examined the glands of twelve cases of eclampsia—one of retroplacental hemorrhage, four of albuminuria without convulsions, one of pyelonephritis, three of broncho-pneumonia, three of puerperal infection and four of tuberculosis. He has tabulated his results. He finds hyperplasia in these cases of nephritis. The heart was slightly hypertrophied and the arterial tension was elevated, but the suprarenal hypertrophy was the primary factor. The author concludes that in eclampsia, retroplacental hemorrhage and nephritis of pregnancy there is cortical hypertrophy and generally medullary hypertrophy of the suprarenal capsules. The cortical reaction is in relation with the antitoxic function of the gland, and probably also with the angiotonic function, but the two actions are dissociated. The exact mechanism of the angiotoxic action of the gland is not fully understood as yet. The suprarenal hypertrophy was secondary to the kidney lesions in all these cases.

So-called Eclampsia without Convulsions.—G. Brunet (*Gyn. Rund.*, H. 5, 1908), after describing several cases observed by himself, states his belief that there is a specific affection of pregnant women in which there are changes of a parenchymatous nature in the blood and the kidneys which would naturally produce convulsions, yet in which these are never present. Kidney symptoms may be absent in slight or severe cases of this type, yet there are brain symptoms ending in death without any convulsions. Autopsy will give evidences of kidney and brain changes similar to those of the fully-declared eclampsia. The author has seen three cases in which the pathological findings at autopsy were marked, but which had not showed convulsions before death. Of these he gives detailed histories. There were hemorrhages in kidneys, lungs and liver, parenchymatous degeneration of the heart, and necroses of liver and kidneys, with multiple thromboses in the vessels. Vomiting, headache, and excitement were prominent symptoms, and coma came on suddenly from which recovery never occurred. The poison of the intoxication seems to be so severe that the nervous system is completely crippled and cannot produce any motor symptoms. Large amounts of albumin and casts are generally present, with high tension pulse and even anuria. The symptoms are almost exactly the same as those of nephritis coinciding with pregnancy, with the absence of eclamptic attacks.

Treatment of Puerperal Eclampsia.—E. Pestalozza (*Ann. di Ostet. e Gin.*, March, 1908) has made a study of the treatment of eclampsia, tabulating 100 cases treated at the clinic for obstetrics and gynecology at Florence. These cases were treated from 1894 to 1905, and were all the cases of eclampsia occurring among 11,313 cases delivered at the hospital. A fact that has been noted is the increased number of cases of eclampsia in the cold months. This depends on the reduction of the skin functions due

to the life indoors and the covering of the skin with clothing. Examining the statistics published in former years and comparing them with these now obtained, the author is of opinion that the mortality from this disease has somewhat diminished. The author believes that in the lighter forms of eclampsia the ordinary medical means should be used, such as cathartics, hypodermoclysis, morphine and veratrum viride. At the same time measures should be taken to expedite delivery, since convulsions generally stop as soon as the uterus has been emptied. Violent measures should not be undertaken for this purpose. Cesarean section cannot be absolutely excluded as an indication, but the author believes that cases in which it should be used are rare, and that the following conditions must be present; A very grave condition of the mother which has resisted all therapeutic measures; a uterus that is undilated and not likely to become dilatable in a time that will permit of delivery before the death of the mother; the fetus living and not menaced by immediate death.

Antithyroidin Moebius in Osteomalacio.—Rudolf Hoffmann. (*Zent. f. Gyn.*, May 2, 1908) cites the analogy of osteomalacia and Basedow's disease; in osteomalacia there is hypersecretion of the ovary; in Basedow's diseases hypersecretion of the thyroid. In the former, removal of the ovaries brings about a cure, in the latter thyroidectomy. Both appear to be diseases of the female genital organs. Their influence on the metabolism of phosphates is the opposite: extirpation of the ovary lessens the elimination of phosphates; administration of ovarian substance increases it. The secretory power of the ovaries rises and falls with that of the thyroid. As the hemodynamic power of the ovary lessens, that of the thyroid takes its place. There is no known case of osteomalacia in which exophthalmic goitre occurred later, but a considerable number in which changes in the bones, or complete osteomalacia, have been followed by Basedow's disease. The author has had prepared for use in osteomalacia a serum from the blood of sheep which had been ovariectomized. He believes that the active principle is the adrenalin-holding power of the serum, which has been called Moebius' serum. Since, in osteomalacia the pupils become contracted, and adrenalin contains antagonistic substances, and since there is an antagonism between the adrenal capsules and ovaries, and the extirpation of ovaries increases the elimination of phosphates, it seems likely that the insufficiency of the suprarenal capsules is of importance in this disease, and the administration of Moebius' serum should be of value. At first the serum is given in very small doses. The patient receives for two days, three times a day, thirty drops of serum; a day's rest is given, and then this course is repeated. This is done until 60 c. c. have been taken. Five days' rest is then allowed before continuing the administration. This treatment was given in a patient in whom the bone changes had gone so far that she was unable to walk, but was carried into the

ward. After one month of treatment, the patient having taken 120 c. c. of serum by mouth, she was able to be up all day, to walk without help, was entirely free from pain and felt perfectly well.

Lysol Poisoning by Intrauterine Injections.—W. Piltz (*Munch. med. Woch.*, May 5, 1908) says that the early statements that this drug was not poisonous have not been borne out by experience. Even with very dilute solutions, cases of serious poisoning have been observed. There have been noted local dermatitis, eczema and pustulation. Internal poisoning has also been caused, which seems to depend on the absorption of the drug into the circulation and the production of an acute nephritis. The skin eruptions have been extensive beyond the area that was touched by the solution, and even have become universal. The author gives examples of collapse occurring after intrauterine injections. Phenol has appeared in the urine, and the kidneys have been colored phenol-brown in fatal cases. The author believes that it is better to make use of boiled water in intrauterine injections than to use such dilute solutions of lysol as will be nonpoisonous, because these weak solutions are not bactericidal. The prognosis of lysol poisoning in newly-delivered women seems to be bad.

Indications for Pubiotomy.—E. Bumm (*Zent. j. Gyn.*, May 9, 1908) wishes to add one indication for the performance of pubiotomy to those given by other authors. The degree of pelvic contraction that requires pubiotomy has been given variously as 7 to 9½ cm. The author cites a case of normal pelvis in which, on account of the size of the fetal head, delivery by natural means was impossible. The head would not descend, and after long waiting the woman was delivered by pubiotomy. The author believes that in such cases there is a time when waiting has been carried far enough, and when widening of the pelvis becomes justifiable. If delivery is not accomplished, the life of the mother may be sacrificed. Forceps will not improve the condition at all, since the disproportion between the fetal head and the pelvis remains the same.

Rupture of the Uterus.—Fournier (*Bull. de la Soc. d'Obst. de Paris*, April 16, 1908) describes a case of rupture of the uterus in the third labor of a woman who had undergone two Cesarean sections, the rupture occurring in the thinned cicatrix of the sections, and coming on spontaneously at the beginning of an induced labor at term. There were extreme shock and internal hemorrhage, but the patient recovered after vaginal hysterectomy. The author has observed nine cases of uterine rupture and three autopsies for death in labor in which obstetrical operations had torn away the cervix or torn the commissure of the neck as far as the peritoneum. The cause is always traumatic when rupture has not occurred spontaneously. The author has done forty-nine Cesarean sections with three deaths, and two of the women had been operated on the second time by Cesarean

section. He advocates preventive hysterectomy in women who have undergone a second Cesarean section. The treatment of uterine rupture demands laparotomy as rapidly carried out as possible. The vaginal route is too slow for such a complication.

Osteoplastic Operation for Widening the Pelvis.—P. Mathes (*Zent. f. Gyn.*, April 18, 1908) describes a new procedure proposed by himself for obtaining permanent widening of the pelvis. He operates in flat pelvis in the interval of pregnancy. He makes a small opening in the skin on each side of the symphysis parallel with the upper margin and scrapes off the periosteum on each horizontal ramus with a raspatory, then cuts through the ramus from within with a wide chisel. The same procedure is gone through for the inferior ramus and the ligaments are cut through, so as to leave the center of the symphysis unattached to the lateral portions. There is now a wedge-shaped portion of bone free, 6 to 8 cm. wide. By bending and pressing apart the bones, it is possible to push this section upward and forward so that it is placed in front of the symphysis, its sloping edges preventing it from being pushed inward again. A thin metal plate may be placed between the pieces of the bone, or they may be wired in position. This is removed in two weeks. The antero-posterior diameter is enlarged and at the same time the pelvis is widened. The pelvic outlet remains unchanged.

Manual Compression to Prevent Hemorrhage after Labor.—Lajos Goth (*Zent. f. Gyn.*, April 11, 1908) says that in cases of inertia the fundus uteri is deeply behind the symphysis and cannot be easily grasped. He presses with the side of the thumb and first finger of the right hand behind the symphysis, and with the other raises the uterus upward toward it. He has made use of this maneuver in eight cases which he describes. The right hand presses the uterus against the left, and the movement is eminently successful in preventing hemorrhage.

Puerperal Tetanus.—Roussiél (*Gaz. de Gyn.*, April 15, 1908) gives the bacillus of tetanus as a rare cause of puerperal sepsis. The case observed by him was one in which the bacillus of Nicolaiër was inoculated upon a placental lesion. It was found in the uterine tissues accompanied by the staphylococcus. Inoculated under the skin of a rabbit it caused rapid death, with symptoms of tetanus. The patient was forty years of age, and entered the hospital for symptoms of stiffness and spasm of the jaws. She spoke with difficulty, could not swallow and had frequent contractions of the pharynx. The back and arms were affected by the spasmodic symptoms, and the patient could not lie down. The uterus was swollen, dark in color, congested and on the posterior wall were placental fragments of a gray color. Here was the door of entry of the poison. Injections of this material caused animal tetanus. The bacillus was found in stained sections, associated with the staphylococcus. There was a marked hyperleukocytosis. This is present in acute tetanus. with polyuucleosis.

Puerperal Staphylococcus and Colon Bacillus Infections.—Marquis (*Ann. de Gyn. et d'Obst.*, April, 1908) has examined the blood of patients affected with puerperal infection, with reference to the occurrence and frequency of infections not caused by the streptococcus. He especially sought for the staphylococcus and colon bacillus as a cause of infection. He made examinations not of the discharge from the uterus, but of the blood of his patients, with the object of obtaining a pure culture of the infecting germ, and believes that this method of culture and examination will prove of great service in solving the vexed question of the cause of puerperal fever. Of infection caused by the staphylococcus he found four cases. Of these three were cured. This seems contradictory to the experience of Schwetz, both of whose patients died. The duration of infection with this germ is long, and when pure it is not generally fatal. Of infections caused by the colon bacillus the author found three. This is a very rare condition, as far as published cases indicate. When there is no mixed infection, this infection is not very grave and its duration is very long, fever running for several months in some cases. When metastases have taken place, involving the brain and meninges, the prognosis becomes bad. When associated with the streptococcus, the disease is generally fatal. Sero-diagnosis will furnish valuable diagnostic data in these cases.

Ligature of the Veins the Best Means of Treating Pyemic Puerperal Thromboses.—Heinrich von Bardeleben (*Berl. klin. Woch.*, Feb. 10, 1908) says that opponents of ligature of the veins in puerperal thrombosis base their arguments on statistics and on the possibility that the case might have been cured without operative interference. The number of operative cases is still too small to give valuable statistics. Examination of the results of cases not operated on shows very unsatisfactory endings. Thromboses occur in veins that have been injured, since bacteria fasten themselves on the walls of the vessels only after the endothelium has been injured, so great is the natural power of the coats to withstand infection. When the organisms are very virulent, acute pyemia and rapid death follow. When virulence is less, there is chronic pyemia or thrombophlebitic sepsis. There is no better means of combating a thrombophlebitis than by ligation of the vein and isolation of the focus of infection. Operation should not be done as soon as a chill occurs. We may be dealing with a rapid infection, in which case the operation will be useless. When chills have been repeated and it is possible to palpate the convoluted veins hardened by the presence of the thrombus in the ovarian or median iliac veins, it is indicated to open the abdomen transperitoneally and ligate the hypogastric and spermatic veins. This will be about three or four days after the beginning of alarming symptoms. Much may be lost by waiting too long. The patients are not so much weakened in an early operation; metastases and heart failure are not so imminent, nor is pulmonary embolism so likely to occur. There

is no reason for allowing three-quarters to two-thirds of the victims of thrombosis to die without succor. Two cases operated on by the author serve as examples. Both were instances of the most dangerous form of pyemia after abortion and manual removal of the placenta. One was a case of typical chronic pyemia, the second of acute pyemia. Both were operated on late, the chronic one on the fifty-seventh day, the acute on the eighteenth day after the beginning of chills. Improvement began as soon as the septic thromboses were walled off from the general circulation and both patients recovered.

Collargol in the Treatment of Puerperal Infections.—E. Bonnaire and Cyrille Jeannin (*L'Obstét.*, April, 1908) describe the effects and method of use of collargeli in puerperal infections. This drug has been used extensively and with good results in many cases in surgery and medicine. It is a blackish, metallic substance formed of minute grains, neither caustic nor irritant and soluble in water. Its use is entirely harmless. Its action is antiseptic, inhibitory against germs and catalytic. It penetrates easily into the body and its action is comparatively rapid and transient. The best method for its use in infections is by intravenous injection, since thus its action is rapid and painless. The authors have made use of it in forty-nine cases between the years of 1903 and 1907. Three of these cases were removed from the hospital before any estimate of its effect had been made, and three were cases in which its use was prophylactic only. Thus we have forty-three cases, with ten deaths; that is a mortality of 76 per cent. Only cases that were in a serious condition were treated with it. It was used only after all other means had failed. The reaction manifests itself by a chill and a rise of temperature, which is followed in favorable cases by a gradual fall of temperature and a sense of well-being, absence of headache, insomnia and other distressing symptoms. These cases go on to a rapid cure. In unfavorable cases the fall of temperature is not present. When the collargol has been injected *in extremis* this reaction is absent. There is an increase in the number of leukocytes after the injection. Renewed injections are required, one to three or four in some cases, since the action of the drug passes away rapidly. It is well to use the collargol in all cases in which puerperal fever is feared, such as putrefaction of the amniotic fluid, fever during labor, chills, etc. Intramuscular injections may be combined with the intravenous ones, being given morning and night. The technic of the injections is perfectly simple, the injections being made into the upper arm. The author concludes that this method is efficacious in generalized puerperal infection, and should be used when other means of treatment have failed. The only method for its use is the intravenous one.

Treatment of Puerperal Infection by the Lactic Acid Bacillus.—M. A. Brindeau (*Bull. de la Soc. d'Obst. de Paris*, April 16, 1908) conceived the idea that since the streptococcus does not grow well in an acid medium and the lactic acid bacillus is not patho-

genic, the latter might be used as a remedy for puerperal fever. He has treated three patients with it. He makes use of a bouillon culture of the lactic acid bacillus, which he mixes with sterilized milk-sugar. This bouillon is used for vaginal packing, and with a syringe in the uterus. It is used for vulvo-vaginal wounds also. No antiseptic injections are used before or after the applications. The histories of the three cases are given. The vulvo-vaginal wounds were observed to change their appearance rapidly, and the temperature was lowered. No bad results were seen, and all three of the patients recovered. It is an excellent remedy for the vulvo-vaginitis of pregnancy. The author advocates further use of this method until a thorough test of its efficacy has been made.

Salpingitis and Abortion.—M. A. Brindeau (*Ann. de la Soc. d'Obst. de Paris*, April 16, 1908) reports three cases of salpingitis accompanying pregnancy and causing abortion. They show that salpingitis accompanying pregnancy may give rise to serious accidents. It easily produces abortion, probably by infection of the ovum. It may become the cause of an error of diagnosis which may result fatally. When the abortion has taken place, the woman is not through with her troubles. When the uterus is emptied, this may give rise to a fresh attack of inflammation and rupture of the pus pocket. This is a very grave complication, producing septic peritonitis which, like all puerperal peritonitis, is very fatal. The only possible treatment is hysterectomy done as rapidly as possible, with vaginal drainage. Recovery is a rare exception. When the diagnosis halts between a salpingitis and a hematocele, an exploratory colpotomy should be done.

Maceration of the Fetus in Relation to Legal Medicine.—G. Pisane (*Annali di Ostet. e Gin.*, March, 1908) has made a study of fetal conditions after death and maceration have taken place, in order to ascertain whether there is any reliable criterion that will show the date of death. He finds that the fetus is very flaccid, the serous cavities are all full of a limpid hematic fluid, all the thoracic viscera are soft, full of imbibed fluid, the bones of the cranium are movable, and there is blood pigment in many organs. The author believed that this sign would be of diagnostic value. He made examinations into the pigment contents of the tissues of sixteen macerated fetuses and gives his conclusions. By osmotic diffusion the blood pigments pass out of the vessels into the tissues after the endothelium has softened. There is a gradual increase in the amount of pigment in the tissues as time goes on. These results should be used with great caution in medico-legal work; but used in this way, they are of value in showing the length of time that the fetus has been dead.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

EXPERIENCES WITH THE CONJUNCTIVAL AND CUTANEOUS TUBERCULIN TESTS AT THE TUBERCULOSIS CLINIC OF THE PRES- BYTERIAN HOSPITAL.

BY

HENRY L. SHIVELY, M. D.,

New York City.

(With two illustrations.)

IN January of the current year a systematic beginning was made in the examination of all children in the families of tuberculous patients at the Presbyterian Hospital Tuberculosis Clinic. Such action appeared desirable as a result of the visits of the district nurses engaged in the supervision of tuberculous patients in their tenement homes. In many cases the nurse has referred patients to the clinic who had not suspected their disease and it appeared probable that additional cases of tuberculosis would be found where tuberculosis was already known to exist, the opportunity for household infection, especially for children, being most apparent. This view has been further emphasized by the opinion recently expressed by Holt (1) that tuberculosis in infants in tuberculous households is far more common than is generally supposed. In nineteen months he has seen sixty-seven cases of pulmonary tuberculosis in infants in whom the diagnosis in over 80 per cent. was made by finding tubercle bacilli in the sputum. Many of these cases presented no symptoms of the disease.

The ordinary methods of diagnosis, satisfactory enough usually in the case of adults, are inadequate when applied to children, the difficulties being much greater in the latter case in reaching a positive conclusion. The physical signs of tuberculosis in young children are ambiguous and often misleading, the temperature and weight records have not the same value as for adults, it is frequently difficult or impossible to obtain sputum for examination, and the injection of tuberculin for diagnostic purposes is

unreliable on account of the less stable temperature of children. A certain diagnosis can often only be obtained by careful and long continued observation. It was hoped that in either the Calmette or Von Pirquet test an ideal, rapid, safe and easily applied diagnostic method had been obtained.

Since the publication of Von Pirquet's original communication before the Berliner Medicinische Gesellschaft on May 15, and Calmette's paper before the Académie des Sciences, June 17, 1907, a voluminous literature has arisen regarding the cutaneous and conjunctival tests. Much of this literature is conflicting as to their value, and in many reports there is a disregard evinced for the limitations laid down by Von Pirquet. The positive reaction he considers to be of little value for adults, 90 per cent. of all of whom he distinctly states react positively, owing to latent or healed foci of tuberculosis which give no clinical symptoms. Between the ages of eight and fourteen, according to Von Pirquet, 35 per cent. of all children, sick and well, react. The test is of greatest value, according to its originator, below the age of two. Von Pirquet claims in his original communication that the only cases of tuberculosis which fail to respond to the test are advanced cases within a week or ten days of death, acute miliary tuberculosis, and cases of tuberculous meningitis.

Calmette considers his conjunctival test to be of greater value than the cutaneous in adults, fewer of whom without symptoms of tuberculosis react to the former. He also claims for diagnosis as good results as are obtained from subcutaneous injections of tuberculin, and that compared with Von Pirquet's test its results are as good in children and are more reliable for adults.

These claims have been disputed. Klineberger (2) has pointed out that a considerable number of first- and second-stage tuberculous cases with tubercle bacilli in the sputum failed to react to the Calmette test.

Reuschel (3) considers the Von Pirquet test not only distinctly superior to the Calmette, but the most convenient and most suitable of all the tuberculin tests for purposes of diagnosis in the first two years of life a positive reaction being almost invariably associated with manifest active tuberculosis. After two years, according to him, the negative reaction is of greater value than the positive.

E. Feer (4) also considers the Von Pirquet test to be the more reliable.

Engel and Bauer (5), however, reported a positive Von Pir-

quet reaction in five infants in the first year of life with no clinical evidences of tuberculosis. One of these which came to autopsy also failed to show after the most searching pathological examination any sign of tuberculosis. The other four when tested did not react to tuberculin injections.

Sicard and Descomps (6) consider the cutaneous reaction less certain and reliable than the conjunctival test of Calmette.

Olmer and Terras (7) concur in this opinion. French writers in general regard the Calmette as superior, the German prefer the Von Pirquet.

MacLennan (8), Webster and Kilpatrick (8) also report favorably upon the Calmette test. The latter two writers, in an analysis of 121 cases, state that all definite cases with bacilli in the sputum reacted positively.

S. Cohn (9) points out that typhoid patients, especially during convalescence, very frequently exhibit a positive reaction to the conjunctival test. He also considers that a second test will often produce a reaction when a negative result was first obtained, that the eye is sensitized by the first instillation, and that the second test is of little value in diagnosing tuberculosis.

Smithies and Walker (10) consider the conjunctival test of undoubted service in the diagnosis of tuberculosis. Out of 185 patients clinically diagnosed as tuberculous, 176 gave positive reactions. Out of 188 persons suffering from disease not tuberculous and including a fair proportion of apparently normal individuals, 186 gave negative reactions and only two positive.

Joannovics and Kapsammer (11) consider the conjunctival and cutaneous reactions and also the subcutaneous injection of tuberculin to be inferior to the method of Bloch, which consists in inoculating guinea-pigs with material supposed to be tuberculous. This he considers to be the best of all the diagnostic tests for tuberculosis.

Weber (12) also considers the subcutaneous injection in the skin of the abdomen of guinea-pigs of supposedly tuberculous material to be the best of all tests for tuberculosis. If the material is tuberculous, lymph-glands in the neighborhood of the injection can be felt at the end of ten to fifteen days, and if these glands are examined the presence of tubercle bacilli within them can be easily demonstrated.

Austin and Grünbaum (13) tried the Calmette test in eight cases of typhoid fever, but failed to obtain a positive result in any. They corroborate the findings of Calmette and French

investigators who consider the conjunctival test to be reliable and a useful aid in diagnosis. In twenty-one positive cases they consider twenty were without doubt suffering from tuberculosis.

It was not long after the publication of Calmette's first article advocating the conjunctival test as a routine and harmless method of diagnosis before reports began to appear, especially in Germany, showing that the procedure was not always as devoid of danger as was claimed.

Wiens and Gunther (14) reported a number of cases of conjunctivitis of unusual severity, extreme edema of the lids, conjunctival hemorrhages, phlyctenulæ, keratitis and pannus following the Calmette test.

Eppenstein (15) has also reported cases of keratitis.

Webster and Kilpatrick (16) report a case of phlyctenular conjunctivitis following the Calmette test.

Barbier (17) reports a case of ulcerative keratitis which resulted in a central leucoma and permanent corneal opacities following the conjunctival test.

Rénon (18) reported a severe case of interstitial keratitis due to the instillation of the 1 per cent. tuberculin solution.

Van Durme and Stocké (19) report five cases of phlyctenular conjunctivitis following the Calmette test and they do not think it is prudent to use the solution stronger than one-half of 1 per cent. for the eye.

Calmette (20) claims that any possible bad eye effects are to be avoided by proper technic, strict asepsis and cleanliness. The conjunctival test he considers (21) is not in itself a source of danger to the eye, but it should be employed only after a thorough examination of the patient's eyes has been made. He considers it safe for diagnosis of disease of the lids and lachrymal ducts, but not for lesions of the eyeball.

Hansell (22), of Philadelphia, reports a case of double miliary tuberculosis of the conjunctiva in which the Calmette test failed to react. He regards it as of little value. In positive cases of tuberculosis the reaction was present in only 25 per cent.

Last January a supply of precipitated tuberculin in 1 per cent. solution as recommended by Calmette was obtained from the Health Department Laboratories, through the courtesy of Dr. William H. Park, for use at the Presbyterian Hospital Clinic and was employed in the following cases:

CASE I.—M. S., a girl, aged twelve. Two brothers have consumption and are under treatment at the clinic. With the ex-



FIG. 1.—A negative Von Pirquet reaction.



FIG. 2.—A well-marked positive Von Pirquet reaction.

ception of whooping-cough and measles, was well until four weeks ago, when she began to cough. Muco-purulent, blood-stained sputum, some loss of flesh, short of breath on exertion, appetite and digestion poor; pains in back and chest.

Physical Examination.—May 18, 1907. Pale, poorly nourished. Dullness, bronchovesicular breathing over upper lobes. Temperature, 97; pulse, 98; weight, 78½ pounds.

January 15. Calmette test positive. May 13th. Signs persist. No tubercle bacilli in sputum. Von Pirquet positive.

CASE II.—G. G., aged twelve, girl; mother and father have both been treated at the clinic for tuberculosis. Gives a history of cough for an indefinite period; sputum scanty. She has had chilly sensations, fever in the afternoon; appetite poor, is easily fatigued.

Physical Examination.—Pale, poorly nourished child. Dullness, increased breathing over both upper lobes. No tubercle bacilli in sputum; cervical glands enlarged. Temperature, 98.6; weight, 76¾. January 15, Calmette positive.

CASE III.—A. G., a boy, aged fourteen. Sister died of consumption, father has chronic cough. Previous history good except that he has always been delicate. For five weeks he has had a cough, worse at night. Purulent sputum; occasionally hemoptysis and night-sweats; fatigue on exertion, loss of flesh; chilly sensations, fever afternoons. Pains in chest, appetite and digestion poor. Temperature, 98.8; pulse, 90; respiration, 20; weight, 74½.

Physical Examination.—December 11, 1907. Pale, poorly nourished. Dullness, harsh breathing, coarse râles over right upper lobe. February 1. Calmette negative. Cough and physical signs continued for seven weeks and then they began to clear up, râles first disappearing. On March 2, still some dullness and increased breathing over the right upper lobe. On May 1, he had gained 6½ pounds. Temperature was normal and there were no morbid pulmonary signs. In this case a positive clinical diagnosis of tuberculosis was made, which was negated by the Calmette reaction, and the subsequent clinical course corroborated the findings of the conjunctival test.

CASE IV.—M. D., a boy, aged five; three sisters have been treated in the clinic for tuberculosis of the lungs, a maternal great-aunt and cousin died of consumption. He had always been a delicate child since an attack of diphtheria at eighteen months, and has had frequent attacks of bronchitis. He was brought for examination. No present symptoms.

Physical Examination.—January 20. Rather undersized and poorly nourished. A few small cervical glands are palpable on left side of neck. Heart and lungs normal. Calmette negative. Temperature, 99.6; pulse, 104; respiration, 24; weight, 39½ pounds. May 27. Has recently had a severe attack of measles with complicating bronchopneumonia, but has developed no signs of tuberculosis. Weight, 40¾.

CASE V.—E. G., a girl, aged fifteen. Maternal grandmother and two aunts died of consumption. Had inflammation of the lungs and measles when two years old. For a year and a half she has been delicate. For six months she has had a cough; purulent sputum, hemoptysis a year ago. Loss of flesh and strength, chilly sensations, no fever, marked dyspnea, no night-sweats, pain in the right chest; appetite variable, digestion fair. Has never menstruated.

Physical Examination.—November 1, 1907. Pale and poorly nourished. The cardiac area is increased downward and to left, apex beat in sixth space; loud presystolic and systolic murmurs at the apex. Pulmonary second sound is much accentuated. Marked dullness, increased breathing and subcrepitant râles over the right upper and middle lobes. Temperature, 98; pulse, 94; respiration, 22; weight, 66½ pounds. No tubercle bacilli in sputum. This was rather a puzzling case resembling others that we have had at the clinic in children in whom, with marked cardiac lesions, there existed signs in the upper part of one or both lungs indicating tuberculosis. December 23. The râles and dullness over the right upper lobe had in great measure cleared up. Temperature, 99.2; weight, 68 pounds. By January 6, there was no dullness and the râles had practically disappeared. On January 27, the Calmette test was applied with positive results. The girl's pulmonary symptoms have since entirely cleared up and there is no evidence of tuberculosis.

CASE VI.—M. L., a girl aged twelve, well nourished. Brought for examination on account of tuberculosis in the family, the mother being a patient in the clinic. Cough for several months, purulent sputa.

Physical Examination.—January 29. Dullness over left apex anteriorly. Exaggerated breathing and voice at the right apex behind. Calmette reaction negative.

June 3. Chills, fever. Cervical glands enlarged. Dullness, increased breathing over left apex, breath-sounds also exaggerated over right apex. Temperature, 99.2; weight, 71½. Von Pirquet positive.

CASE VII.—J. M., boy, aged six. His father has tuberculosis of the lungs and testicle. Whooping-cough three years ago, measles in February.

Physical Examination.—February 24. Well nourished, healthy-looking child. Slight dullness below the second rib over left chest with diminished breathing. Over the right base behind a few fine crepitant râles. Temperature, 99.4. Calmette reaction positive. May 22. Has had no cough and has good appetite. No morbid pulmonary signs, cervical glands somewhat enlarged. Temperature, 98.6; weight, 39. Von Pirquet positive.

CASE VIII.—K. K., girl, aged fifteen. Mother under treatment at the clinic for tuberculosis of the lungs. Has had scarlet fever and diphtheria. Was well until a few days ago, when she was attacked by a cough, which has been especially severe at

night. Mucopurulent sputum; no hemoptysis. Appetite and digestion good. No loss of flesh or strength.

Physical Examination.—April 24. Pale, poorly nourished. Slight dullness over both apices. Large cervical glands. Temperature, 98; pulse, 90; respiration, 24; weight, 87½. No tubercle bacilli in sputum. Calmette test positive. May 22. Slight dullness over right apex. Temperature, 98.6; weight, 88½ pounds. No cough.

CASE IX.—B. F., a girl, aged thirteen. Mother and brother have both been under treatment for tuberculosis of the lungs. She was treated in the children's department three years ago for "lung trouble." Has always coughed. Has now purulent sputum; hemoptysis for the first time yesterday; sputum streaked. Has occasional night-sweats, dyspnea on exertion; chilly sensations, fever afternoons. Has lost flesh and strength and has pain in her left side. Appetite poor, digestion fair.

Physical Examination.—May 15, 1907. Poorly nourished, pale, cervical glands enlarged. Dullness, increased breathing over the right upper lobe. Percussion note high-pitched over left. Temperature, 99; pulse, 92; respiration, 24; weight, 79; a week ago, 83. No tubercle bacilli present in the sputum. After six months, under treatment, signs were slight and doubtful; still had a temperature of 99.2; weight increased to 95½. Calmette test negative. A few weeks later the temperature was normal. No cough or morbid pulmonary signs.

CASE X.—K. H., aged eighteen. Stenographer. Family history negative. For a year has had a cough, mucopurulent sputum; occasional hemoptysis and night-sweats. Loss of flesh and strength, fever in the afternoon. Appetite and digestion good. Menstruation scanty and irregular.

Physical Examination.—May 24, 1907. Dullness, increased vocal fremitus, rough breathing over the right upper lobe; cervical glands enlarged. Weight, 110. No tubercle bacilli in sputum. Under treatment, her condition improved and her signs became less marked. February 1. Calmette reaction was positive. The patient developed the severest reaction we have seen in the clinic. For more than a week following she had a conjunctivitis and a profuse mucopurulent discharge, her lids being adherent mornings. March 2, weighed 113. There was dullness, increased breathing over both apices. Over the right, fremitus increased. Behind whispering bronchophony. Sputum was again examined on March 11; no tubercle bacilli.

CASE XI.—J. T., aged twenty-four. Carpenter. Family history negative. Typhoid fever, pneumonia seven years ago. For four months a slight cough; scanty sputum, hemoptysis a month ago. Occasional night-sweats, marked dyspnea, loss of flesh and strength. Pain in right chest, appetite and digestion fair.

Physical Examination.—March 4. Tall, poorly nourished, ill developed. Dullness, increased breathing over the right upper lobe and left apex. Temperature, 98; pulse, 70; respiration, 22;

weight, 139½. No tubercle bacilli in sputum. Calmette positive.

An analysis of the Calmette cases, twelve in number, including Case XXVIII of the Von Pirquet series, shows that of seven positive reactions, but three were undoubtedly tuberculous. In three, tuberculosis could be clinically definitely excluded, and one case was doubtful with the preponderance of evidence in favor of absence of tuberculous disease.

Of the five cases which reacted negatively, three were clinically not tuberculous. In two of these cases a definite positive diagnosis of tuberculosis had been made. In the subsequent course of the disease all symptoms cleared up, physical signs disappeared and the negative findings of the Calmette test were confirmed. In two cases in which the clinical diagnosis of tuberculosis seemed well-established the Calmette was negative.

On account of the severity of the reaction in two cases, one of which resulted in conjunctivitis of considerable intensity, lasting for more than a week, and the appearance in the literature of reports of cases of keratitis, ulceration of the cornea, intense chemosis, pannus and permanent opacities, it was felt that the Calmette test was not as innocuous, as had been claimed, and that it was unsuitable to use in the case of strumous and cachectic, poorly nourished children in attendance at a clinic where they could not be kept under constant observation. The Von Pirquet test appeared to be free from these objections, although somewhat less easily applied. A supply of Koch's old tuberculin was obtained from the Health Department which for use was diluted to make a 25 per cent. solution with sterile normal salt solution, according to the original Von Pirquet formula.

In each case the arm of the patient was carefully cleansed by scrubbing with green soap, followed by ether and alcohol. The skin was abraded over three small areas of not more than one-fourth inch in extent, separated from each other by a space of an inch, a different sterile needle being used for each case. A small drop of the tuberculin solution was rubbed with the needle point into the two outer abrasions, the inner scarification being used for a control. The surfaces were permitted to dry and the whole concluded by the application of a sterile dressing. The patient was brought to the clinic or visited by the nurse within forty-eight hours after the inoculation.

CASE I.—R. S., an Italian girl, aged fourteen. Family history negative. Except for an attack of measles, has always been well

until present illness. Has had a cough for seven months, mostly at night. Purulent sputum. Hemoptysis several months ago. Considerable loss of flesh and strength; occasional night-sweats. Marked dyspnea. Chilly sensations, fever afternoons; appetite and digestion good. Has menstruated but once, last October.

Physical Examination.—April 24. Pale, poorly nourished. Dullness, bronchial breathing over both upper lobes, below the clavicle near the sternal end at right apex is an area of flatness, cavernous voice and breathing. Over the left upper lobe there are numerous subcrepitant râles. Tubercle bacilli in sputum. Temperature, 99.6; pulse, 140; respiration, 24. Von Pirquet positive.

CASE II.—M. F., a girl, aged thirteen. Mother a patient at clinic with tuberculosis of the lungs. Came for an examination. No pulmonary or other symptoms.

Physical Examination.—April 29. Enlarged cervical glands. Chest shows no morbid signs. Von Pirquet negative.

CASE III.—J. M., aged eight. Father died of consumption a year ago. Has tubercular arthritis of the right hip for which he is wearing a plaster splint applied at the Forty-second Street Hospital. Had measles and whooping-cough a year and a half ago, since then cough which has been more severe at night. No sputum. No hemoptysis, dyspnea on exertion. Loss of flesh and strength; appetite and digestion poor; has fever at night.

Physical Examination.—April 29. Poorly nourished; has enlarged cervical glands; dullness, bronchial breathing, subcrepitant râles over both upper lobes, more marked over right. Temperature, 98.6; pulse, 96; respiration, 24; weight, 45½. Von Pirquet test positive.

CASE IV.—J. T., aged eight. For four weeks has had a cough and mucopurulent sputum.

Physical Examination.—January 27. Pale. Cervical glands enlarged. Heart and lungs normal. April 1. Had measles. Cough since then. Profuse night-sweats; has lost flesh; fever at night; appetite poor; no positive pulmonary morbid signs. Cervical glands much enlarged. Temperature, 98; weight, 49⅞. Von Pirquet positive. June 5. Moderate dullness, fine râles over right upper lobe. Temperature 98.4, weight 51¼. No tubercle bacilli in sputum.

CASE V.—J. M., a girl, aged seventeen. Mother died of consumption, also two maternal aunts and an uncle, and another maternal uncle is tuberculous. She has had measles, and seven years ago typhoid fever. Is under treatment for atrophic rhinitis. Has had a winter cough for several years. Cough is worse mornings; sputum is purulent, has several times been streaked with blood. She has lost flesh and strength; has profuse night-sweats, marked dyspnea on exertion, occasional chills, pain in chest, fever afternoons, appetite poor, digestion good. Amenorrhea for two months.

Physical Examination.—May 1. Pale, ill nourished, stoop

shouldered. Dullness over both upper lobes, breathing sounds rather diminished. Temperature, 99.4; pulse, 100; respiration, 22; weight, 103½. No tubercle bacilli in sputum. Von Pirquet negative. June 5. Signs persist. Temperature, 100; weight, 104½.

CASE VI.—G. B., aged thirty-eight. Insurance solicitor. Family history negative as to tuberculosis. He had "inflammation of the lungs" when two years old; pneumonia seven years ago. Was rejected for life insurance four years ago by several companies. At that time his physician found a low percentage of sugar in the urine. For three years he has had a slight morning cough with purulent sputum, and for the past year has failed in strength and has lost weight. No hemoptysis or night-sweats; occasional chilly sensations and fever. Appetite and digestion good.

Physical Examination.—April 15. Well nourished, not anemic. Slight dullness and increased breathing over the right apex. Temperature, 98; pulse, 72; respiration, 24; weight, 164. No glucose in urine. No tubercle bacilli in sputum. Von Pirquet positive. May 18. Signs persist at right apex. Temperature, 99½; weight, 163¾.

CASE VII.—W. O., a boy, aged sixteen. Mother died of consumption. He has had measles, scarlet fever and for four years has had a slight cough. Mucopurulent sputum, frequent night-sweats. Occasional chills, and fever in the afternoon. Appetite and digestion fair.

Physical Examination.—April 27. He is undersized, pale, poorly nourished. Dullness, increased breathing and whisper over both upper lobes. Temperature, 99; pulse, 96; respiration, 22; weight, 68¼. May 4. Von Pirquet negative. May 22. Signs are less marked. Dullness, bronchial breathing persists over right upper lobe. Temperature, 98.6; weight, 69½.

CASE VIII.—M. K., a baker, aged twenty-seven. No morbid family history. No previous illness. He caught cold one month ago. Since then a cough, purulent sputum, night-sweats, loss of flesh, some shortness of breath; no hemoptysis; appetite and digestion poor.

Physical Examination.—May 4. Fairly well nourished. Percussion note is high-pitched, increased tactile fremitus over the right upper lobe and left apex. A few clicks on coughing are heard posteriorly over each upper lobe, more over the left than right. Temperature, 98.6; pulse, 76; respiration, 22; weight, 155½. No tubercle bacilli in the sputum. Von Pirquet positive.

CASE IX.—W. C., aged thirty-two. Bartender. Excessive alcohol habit. Family history negative. Had croup when seven years old. Hemoptysis two years ago. Has otherwise been well until three months ago, when he began to cough. Purulent sputum. Dyspnea on exertion; loss of flesh and strength; occasional chills, fever in afternoons; pain in chest; appetite good, digestion fair. Marked dysphonia.

Physical Examination.—April 29. Emaciated, hectic, dullness, increased vocal fremitus, bronchial breathing and whisper over both upper lobes; over right, subcrepitant râles. Temperature, 101; pulse, 100; respiration, 22; weight, 114; a few months ago, 120. Laryngological examination shows infiltration of arytenoids and interarytenoid commissure. Many tubercle bacilli in sputum. Von Pirquet positive.

CASE X.—M. S., a girl, aged sixteen. Father died a year ago of consumption. She was in good health until four months ago when she began to cough. Purulent sputum, night-sweats, loss of flesh and strength, dyspnea, fever afternoons. No hemoptysis. Appetite poor. Amenorrhœa for two months.

Physical Examination.—February 21. Marked dullness, bronchial breathing. Increased whisper over right upper lobe; over left apex there is flatness, diminished breathing, cavernous whisper, numerous subcrepitant râles. Temperature, 100; pulse, 104; respiration, 24; weight, 102. Tubercle bacilli present in large numbers in sputum. May 6. Temperature, 102.2; weight, 101 $\frac{1}{4}$. Von Pirquet negative. May 25. Signs persist. Temperature, 101.4; weight, 100 $\frac{1}{2}$.

CASE XI.—R. B., a girl, aged twelve. Half-sister has tuberculous arthritis of the hip. She was in good health until two months ago, when she began to cough. Had severe paroxysms of coughing at night; sputum purulent. Hemoptysis for the first time to-day. Has had night-sweats for a week. Shortness of breath, loss of flesh and strength, frequent chills and fever at night. Appetite poor, digestion fair.

Physical Examination.—May 6. Pale and sallow; fairly well nourished. Numerous enlarged cervical glands. Moderate dullness over both apices. Temperature, 98.6; pulse, 86; respiration, 20; weight, 93 $\frac{1}{2}$. No tubercle bacilli in sputum. Von Pirquet positive.

CASE XII.—M. D., a girl, aged twenty. Telephone operator. Maternal grandmother died of tuberculosis, an uncle died of tuberculous laryngitis and a maternal aunt has been treated for tuberculosis of the lungs at the clinic. With the exception of measles and whooping-cough, has been well until an attack of lobar pneumonia a month ago, complicated with median otitis of both ears. Has had cough since her attack of pneumonia; sputum is purulent. No hemoptysis or night-sweats; no fever. Appetite is poor, but digestion good. Menstruation is regular.

Physical Examination.—May 1. Pale, but fairly well nourished; slight dullness, perhaps, over the right upper lobe is the only suspicious sign in chest. Temperature, 98.6; pulse, 76; respiration, 20; weight, 109 $\frac{1}{2}$; was 115 recently. No tubercle bacilli in sputum. Von Pirquet is negative. June 5. No pulmonary symptoms.

CASE XIII.—T. U., girl, aged nineteen. Waitress. A cousin died of consumption. Father has a chronic cough. She was treated for cough eight years ago, and four and a half years ago

she had ulcers of the leg which were five months in healing. She has had a slight cough for six months. Purulent sputum, no hemoptysis; had night-sweats last summer. Slight loss of flesh, occasional chills, fever in the afternoon. Appetite and digestion good. Menstruation regular.

Physical Examination.—March 13. Well nourished, somewhat flushed. Numerous enlarged cervical glands, those at the base of the right side of the neck being tender and painful. There are dullness, bronchovesicular breathing, and subcrepitant râles over both upper lobes, behind; over the right, the whispered voice is increased. Temperature, 99.8; pulse, 90; respiration, 22; weight, 133 pounds. Many tubercle bacilli in sputum. May 4. Von Pirquet positive.

CASE XIV.—A. P., Italian girl, aged sixteen. Family history as to tuberculosis negative. She was well until a month ago, since which time she has had a cough, which is worse mornings. Purulent sputa, loss of flesh and strength, frequent night-sweats. Occasional chills, fever afternoons. Dyspnea on exertion; no hemoptysis. Pain in her left chest; appetite and digestion fair. Menstruation regular.

Physical Examination.—April 29. Pale, sallow, poorly nourished. Dullness, bronchial breathing and whisper; subcrepitant râles over upper two-thirds of the entire pulmonary area. Temperature, 99.2; pulse, 106; respiration, 22; weight, 83 $\frac{3}{4}$. No tubercle bacilli in the sputum. May 11. Von Pirquet negative.

CASE XV.—N. G., a girl, aged twenty. Sister has been treated at the clinic for tuberculosis of the lungs. She had diphtheria at the age of six. Is very nervous. For seven weeks she has had cough, worse mornings. Purulent sputum, loss of flesh and strength, chilly sensations, fever in the afternoon. No hemoptysis. Pain in the right shoulder; appetite poor, digestion good. Menstruation regular.

Physical Examination.—March 27. She is pale, but fairly well nourished. Slight dullness over the right apex, behind the breathing and whisper are increased and fine râles are heard. Temperature, 99.4; pulse, 100; respiration, 24; weight, 106. No tubercle bacilli in sputum. May 11. Von Pirquet positive. June 5. No râles. Moderate dullness, increased breathing over right apex. Temperature, 99; weight, 105 $\frac{1}{2}$ pounds. Very pale.

CASE XVI.—M. B., a girl, aged seventeen. Mother is under treatment at the clinic for pulmonary and laryngeal tuberculosis. Had scarlet fever and diphtheria at the age of two and one-half years. For two months she has had a slight cough. Purulent sputum, no hemoptysis; profuse night-sweats, loss of flesh and strength, fever afternoons, appetite and digestion good. Menstruation regular.

Physical Examination.—May 15. Cervical glands are a little enlarged. No morbid pulmonary signs. No tubercle bacilli in sputum. Von Pirquet positive.

CASE XVII.—J. W., a boy, aged seventeen. Both parents

died of consumption. Diphtheria six years ago. Has had for many years enlarged glands in the neck. For two months has had a slight cough, mucopurulent sputum. One night-sweat recently. No loss of flesh or strength, some dyspnea. Fever afternoons. Appetite fair, digestion good.

Physical Examination.—May 6. Poorly nourished, pale, undersized boy. Dullness, increased breathing, fine râles over the right upper lobe. Over the left apex percussion note is high-pitched; breathing is increased. Temperature, 100.8; pulse, 104; respiration, 22; weight, 77 $\frac{3}{4}$. Numerous enlarged glands on both sides of neck from the size of a bean to a good-sized nut. No tubercle bacilli in sputum. Von Pirquet positive.

CASE XVIII.—S. P., a girl, aged seventeen. Grandfather and two aunts died of consumption. Measles at the age of four. Otherwise well until three months ago, when she began to cough. Sputum purulent. Has had night-sweats for two months; loss of flesh and strength; fever at night; appetite poor, digestion fair. Menstruation regular.

Physical Examination.—April 3. Poorly nourished, pale. Dullness, increased breathing and whisper over both upper lobes. Temperature, 98.8; pulse, 88; respiration, 20; weight, 96. Tubercle bacilli present in sputum. May 1. Fine râles over the right apex. Other signs continue same. Temperature, 100.2; May 8. Von Pirquet positive.

CASE XIX.—E. A., a girl, aged fourteen. An uncle and an aunt died of consumption. An uncle is now under treatment for tuberculosis of the lungs at this clinic. Patient had measles seven years ago, and "malaria" symptoms for the past year. She has had a slight cough for six weeks. Mucopurulent sputum. Loss of flesh and strength; fever afternoons. Dyspnea on exertion; frequent chilly feelings. Appetite poor. Vomits frequently mornings. Has never menstruated.

Physical Examination.—March 23. She is fairly nourished, but undersized. Dullness, increased tactile fremitus, bronchovesicular breathing, increased whisper over the right upper lobe; behind there are coarse râles over the right apex. Temperature, 100.2; pulse, 122; respiration, 24; weight, 74 $\frac{1}{2}$. No tubercle bacilli in sputum. On April 22, moderate dullness and increased breathing are detected over the left apex also. Temperature, 99; Weight increased to 77 $\frac{1}{4}$. Von Pirquet positive.

CASE XX.—J. V., a girl, aged thirteen. Sister is under treatment for tuberculosis of the lungs at the clinic. She comes for examination. Has no cough or other symptoms.

Physical Examination.—May 8. Patient is rather anemic, undersized. Has no enlarged glands. Heart and lungs appear normal. Temperature, 98; weight, 65. Von Pirquet positive.

CASE XXI.—W. P., a girl, aged eleven. Mother is being treated for consumption at the clinic. Has had measles and whooping-cough during infancy. Has had a cough for three days; no sputum.

Physical Examination.—May 11. Poorly nourished, pale. Dullness over both upper lobes, cervical glands slightly enlarged. Temperature, 99.2; weight, 72. Von Pirquet positive. May 13. Temperature, 99.2. June 3, subcrepitant râles over left upper lobe behind; over right breathing is increased behind. Temperature, 98.6; weight 70 $\frac{7}{8}$.

CASE XXII.—A. Z., aged eight. Father is being treated for tuberculosis of the lungs. He was brought for examination.

Physical Examination.—March 25. Rather undersized, pale and slight. Heart and lungs at that time negative. On May 11, cervical glands enlarged. Dullness over both upper lobes. Temperature, 99.8; weight, 45. Von Pirquet positive. May 13. Dullness over both upper lobes. Temperature, 99.6.

CASE XXIII.—C. B., a girl, aged sixteen. Worker in paper boxes. Mother has pulmonary and laryngeal tuberculosis, a sister and brother are suspects. Previous health good and has no symptoms.

Physical Examination.—May 18. No morbid pulmonary signs. Temperature, 99.4; pulse, 84; respiration, 22; weight, 99 $\frac{1}{4}$. Von Pirquet negative.

CASE XXIV.—E. W., a girl, aged sixteen. A sister is under treatment at the clinic for tuberculosis of the lungs. She had pneumonia at the age of seven and again at ten. Health good until the age of twelve, when she was operated on for tuberculous glands of the neck at the Presbyterian Hospital. She began to cough in February of this year. Has had mucopurulent sputum, which has several times been streaked with blood. She has had night-sweats for the past month; short of breath on exertion; has lost flesh and strength; fever afternoons; appetite and digestion poor. Has had amenorrhea for five months.

Physical Examination.—April 29. Marked dullness over both lungs anteriorly and posteriorly apex to base; flatness, cavernous voice and breathing, showing the presence of large cavities in the upper lobes of both lungs, numerous moist, sticky râles. Temperature, 100.4; pulse 120; respiration, 22; weight, 113. Many tubercle bacilli present in the sputum. May 22. Temperature, 99.6; weight had decreased to 109 $\frac{1}{4}$. Von Pirquet positive.

CASE XXV.—M. B., aged nineteen. Shop girl. Mother has had chronic lung trouble. She had scarlet fever when three years old, also measles. Four weeks ago had adenoids removed. Has had a slight cough for a year. Mucopurulent sputum, night-sweats for a month. Dyspnea on exertion; loss of flesh and strength; chilly sensations; fever afternoons; pain in the right shoulder; appetite poor, digestion good. Menstruation scanty.

Physical Examination.—March 25. Cervical glands are much enlarged, especially on the left side of the neck. Dullness, slightly increased breathing over both upper lobes. Temperature, 100.4; pulse, 126; respiration, 24; weight, 115; a year ago, 130. No tubercle bacilli in the sputum. May 11. Her glands are considerably

diminished in size and pulmonary signs are less marked. Temperature, 99.2; weight, 120. Von Pirquet is positive. Reaction extensive, with a well-marked vesicular eruption.

CASE XXVI.—M. B., a girl, aged eighteen. Cashier. No morbid pulmonary history in family. She had pneumonia, diphtheria and scarlet fever as a child. No cough. Two months ago slipped and fell injuring her left knee, following which she has had synovitis and considerable effusion in the joint.

Physical Examination.—May 22. Heart and lungs negative. The left knee is moderately swollen. No heat or redness. Temperature, 98.2; weight, 114½. Von Pirquet positive. June 1. Knee is much improved.

CASE XXVII.—E. A., a girl, aged eleven. Family history negative. She had diphtheria when three years old, measles at five, scarlet fever, whooping-cough and chicken-pox two years ago. For six weeks she has had a slight cough, purulent sputum, no night-sweats or hemorrhages, no dyspnea, a little fever in the afternoon, no loss of flesh; appetite good, digestion fair.

Physical Examination.—May 22. Fairly nourished, a little flushed; has enlarged cervical glands, dullness, bronchovesicular breathing, coarse and creaking râles over the right apex. Temperature, 99.2; pulse, 112; respiration, 24; weight, 66. No tubercle bacilli in sputum. Von Pirquet positive.

CASE XXVIII.—J. H., a married woman, aged seventeen. Family history negative. She was treated in Presbyterian Hospital two months ago for a dry pleurisy. At that time, besides her cough, she had occasional hemoptysis. There were no tubercle bacilli in the sputum, and the conjunctival tuberculin test was negative. She was discharged on March 11. On May 20, she came to the clinic with a history of cough of four months' duration. Purulent sputum, some dyspnea on exertion, loss of flesh and strength, a little fever in the afternoon, pain in the back and chest.

Physical Examination.—May 20. Pale, but well nourished. Slight dullness, increased tactile fremitus over right apex, behind the breathing is increased. Temperature, 99.8; pulse, 100; respiration, 22; weight, 121½. No tubercle bacilli in sputum. Von Pirquet negative. May 22. Temperature, 100.2. June 5. Dullness, increased breathing and whisper over right apex. Temperature 101.4, weight 118½. A considerable hemoptysis to-day. Pain and tenderness in right groin. Vaginal examination shows to right of uterus a tender, painful, obscurely fluctuant mass size of a lemon. June 10. Operation for double pyosalpinx.

CASE XXIX.—A. L., a boy, aged eleven. Mother is under treatment at the clinic for tuberculosis of the lungs. January 29, he came for examination. Heart and lungs negative. Enlarged cervical glands. No cough or other pulmonary signs. May 22. Von Pirquet negative,

CASE XXX.—R. S., a girl, aged eighteen. Family history

negative. Cough, mucopurulent sputum; hemoptysis for two months. Loss of flesh and strength; occasional chills, fever afternoons; dyspnea on exertion; night-sweats, pain in right side; appetite and digestion poor. Menstruation regular.

Physical Examination.—March 2, 1908. Fairly well nourished. Pale. Dullness, fine râles over right apex. Temperature, 98.6; pulse, 96; weight, 124 $\frac{3}{4}$. No tubercle bacilli in sputum. Von Pirquet positive.

CASE XXXI.—C. C., a girl, aged fifteen. Father died of pneumonia; family history otherwise negative. She had typhoid fever when nine years old. Was at Raybrook for six months one year ago. Has had cough for a year and a half. Purulent sputum occasionally streaked with blood; loss of flesh and strength, marked dyspnea; fever afternoons; frequent chills; pain in the right chest; appetite good, digestion poor. Amenorrhea for two months.

Physical Examination.—March 9. Fairly nourished. Numerous enlarged cervical glands. Dullness, increased breathing and whisper; fine subcrepitant râles over both upper lobes, more marked over the right. Temperature, 100.4; pulse, 120; respiration, 24; weight, 95 $\frac{1}{2}$. Tubercle bacilli present in large number in sputum. May 13. Signs persist. Temperature, 100.6; weight, 93. Von Pirquet positive, but slight reaction.

CASE XXXII.—A. W., a girl, aged twenty. Cigarette maker. Father said to have died of consumption. Diphtheria at the age of five. Rheumatism nine months ago. Cough for two months; purulent sputum. No hemoptysis; loss of flesh and strength. Pain in the chest; appetite and digestion poor. Menstruation regular.

Physical Examination.—May 18. Emaciated, chest retracted below clavicles, especially right. Dullness, increased fremitus, bronchial breathing and whisper at the left apex. Dullness, increased whisper over right upper lobe. Temperature, 100.6; pulse, 92; respiration, 20; weight, 96 $\frac{3}{4}$. Von Pirquet positive.

CASE XXXIII.—F. B., a boy, aged eleven. Mother under treatment for laryngeal and pulmonary tuberculosis; has had a cough for an indefinite period.

Physical Examination.—Pale, poorly nourished, left chest is retracted below the clavicle, slight dullness over both upper lobes, no râles, cervical glands are enlarged. Temperature, 98.6; pulse, 90; respiration, 22; weight, 61 $\frac{1}{2}$. Von Pirquet negative.

CASE XXXIV.—L. S., a married woman, aged twenty-eight. Four uncles and aunts have died of consumption. Has always been well until one year ago when she began to cough. Has had scanty purulent sputum; loss of flesh and strength, marked dyspnea, no chills, no fever, appetite fair, digestion poor. Four months pregnant.

Physical Examination.—April 17. Emaciated, pale. Dullness, bronchial breathing, increased whisper over nearly the whole pulmonary area. Temperature, 98; pulse, 80; respiration,

20; weight, 124. A few tubercle bacilli present in the sputum. May 18. Slight hemoptysis for first time. May 27. Von Pirquet positive, but slight.

CASE XXXV.—L. M., a girl, aged nineteen. Cigarette packer. No tuberculous family history. A year ago had a hemorrhage from the lungs. Since then cough, purulent sputum, occasionally feverish, pain in the right chest, no dyspnea or night-sweats. Appetite good; digestion poor; menstruation regular.

Physical Examination.—Feb. 10. Dullness over both upper lobes, lower over the right; râles anteriorly and posteriorly, increased tactile fremitus. Temperature, 99.6; pulse 86; respiration, 24; weight, 95. Tubercle bacilli present in the sputum. May 8. Weight, 91½. May 22. Attacks of hemoptysis coincide with her menstrual periods. Von Pirquet positive.

CASE XXXVI.—J. M., a girl, aged three. Father under treatment for pulmonary tuberculosis. Measles a year ago. Has been subject to cough, which for the last week has been severe: purulent sputum.

Physical Examination.—May 29. Well nourished, no anemia. Cervical glands somewhat enlarged. Breathing harsh over both upper lobes. Temperature, 99.4; weight, 31½. Von Pirquet negative. June 1. Cough much better; breathing sounds normal. Temperature, 99.

CASE XXXVII.—M. V., a girl, aged seventeen. Cigarette maker. Father died of consumption in the Seton Hospital. She was well until two years ago when she began to cough. Has never had any expectoration. No night-sweats, no loss of flesh, some dyspnea on exertion. Appetite and digestion fair. Pain in the left chest. Menstruation regular. She was in the Seton Hospital two and one-half months. Came out one month ago.

Physical Examination.—March 27. Slight dullness, increased breathing over the right apex, whisper increased posteriorly. Temperature 98.8; pulse, 88; respiration 20; weight, 110. May 27. Signs are very slight. Temperature, 98.6; weight, 105. Never has any sputum, unable to examine for tubercle bacilli. Von Pirquet positive.

CASE XXXVIII.—M. S., a girl, aged eighteen. Cashier. Father has tuberculosis of the lungs and tuberculous arthritis of the right shoulder. Mother died of consumption. Was operated on for appendicitis four years ago. Pleurisy and pneumonia three years ago, since which time she has had a slight cough at times; no sputum. Dyspnea on exertion; chilly sensations; loss of flesh and strength; pain at times in right shoulder. No fever, hemoptysis or night-sweats. Appetite fair and digestion good. Amenorrhœa for three months.

Physical Examination.—June 3. Pale, poorly nourished, numerous râles over the left upper lobe front and back. Percussion note and breathing little altered. Several cervical glands enlarged. Temperature, 98.6; pulse, 124; respiration, 22; weight, 101¾. Von Pirquet negative. June 6. Râles had

disappeared. June 10. Well-marked dullness over right upper lobe.

Of the Von Pirquet tests, forty-one in number, including Cases I, VI and VII of the Calmette series, twenty-nine reacted positively. In twenty a definite clinical diagnosis of tuberculosis of the lungs was made. Of four doubtful cases, in three the weight of clinical evidence would incline to a diagnosis of tuberculosis. In the twelve negative Von Pirquet reactions, in six tuberculosis of the lungs was definitely present and satisfactorily established by all the clinical signs and symptoms, in one case tubercle bacilli being present in the sputum. In five tuberculosis was not present and one case was doubtful. In four cases both the Calmette and Von Pirquet tests were tried. In two of these both were positive, in one both were negative, and in one case they conflicted, the Calmette being negative, the Von Pirquet positive, the clinical diagnosis corresponding with the latter.

In the majority of cases here reported the patients have been under careful observation for a period of several months and, it is believed, have been studied with sufficient care to establish or exclude a diagnosis of tuberculosis as far as this is possible from clinical observation alone. It would seem that in the employment of these tests there are sources of error which cannot be satisfactorily explained, and which are frequent enough to cause little dependence to be placed upon them in doubtful cases. If, as Calmette claims, these newer methods are as certain and reliable as tuberculin injections for diagnostic purposes, it would appear that none of the tuberculin tests is absolutely to be trusted. It is probable that in the majority of older children and adults the test is one of too great delicacy, unimportant, healed and latent foci producing a reaction in an apparently healthy individual as intense as manifest tuberculosis with active symptoms. It is more difficult to account for the first and second stage cases, sometimes with bacilli in the sputum, which fail to react. A number of these cases at the clinic have been in fair general condition and cannot be accounted for by Von Pirquet's exceptions in the last stages of tuberculous disease. It would perhaps be unwarranted to draw any general conclusions as to the value of these tests from the number of cases here studied, but as far as they go, it would appear that both the conjunctival and cutaneous tests would very frequently be misleading if depended upon for the diagnosis of doubtful cases of tuberculosis.

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303 AMSTERDAM AVENUE.

CALMETTE'S OCULO-TUBERCULIN TEST IN ACUTE AND CHRONIC OTITIS MEDIA AND MASTOIDITIS.

PRELIMINARY REPORT.*

BY

EDMUND PRINCE FOWLER, M.D.,
New York City.

BELIEVING that many cases of chronic suppurative otitis media owe their chronicity to an underlying tuberculous condition, I have made use of the oculo-tuberculin test, first proposed by Dr. Calmette, to throw, if possible, more light on this subject.

This preliminary report is made on fifty cases of acute and chronic suppurative otitis media and mastoiditis, in the hope that others will take up the subject and add to the data I have and shall have collected.

*Read before the Riverside Practitioners' Society, May 12, 1908.

In these cases I have made use only of a 1 per cent. aqueous solution of the alcohol precipitate of tuberculin, prepared especially for the oculo-tuberculin test by the Department of Health of the City of New York.

One drop of this solution was instilled into one eye of each patient in the afternoon, about four o'clock, and the eye inspected and compared with its fellow every few hours thereafter, for one or two days, if the patient was in the hospital. If a dispensary case, the patient reported early on the morning of the day following, about nine or ten o'clock, and was visited later in the day if necessary.

In this report I refrain from going into any dissertation as to my deductions from the results observed, but will simply submit an itemized account for the perusal of those who are interested in the subject.

It will be seen by the following statistics that, with two exceptions, every case of suppurative otitis media of more than one month's duration gave a positive reaction to the test.

This is most interesting and suggestive as to the etiology, course and treatment in these cases, and as soon as I have collected sufficient data on these matters, I will report.

Case.	Sex.	Age.	Disease.	Duration.	Personal or family history.	Reaction.
1...	M.	9 yrs..	O. M. S. C....	8 mos..	Cleft palate, parents dead.	xxx
2...	F..	4 yrs..	...do	1 mo...	Acute mastoiditis operation.	xxx
3...	F..	1 yr ..	...do	1 mo...	Both ears affected.	x
4...	F..	9 yrs..	...do	6 yrs..	Right ear, first test negative.	xx
			...do	6 mos..	Left ear, second test in two weeks.	xx
5...	M.	9 yrs..	O. M. S. Ac...	Few days	Left ear	
6...	M.	3 yrs..	O. M. S. C....	1 yr...	Left ear	x
7...	M.	4 yrs..	...do	2 yrs..	Both ears	x
8...	F..	14 mos	...do	6 mos..	Both ears, mother died of t. b.	x
9...	M.	3 yrs..	O. M. S. Ac...	1 week		
10...	M.	13 mos	...do	4 days..		
11...	F..	3 yrs..	O. M. S. C....	... ? ...	Acute exacerbation. Both ears.	x
12...	F..	2 yrs..	...do .....	... ? ...	Mother and uncle died of t. b. Another uncle has t. b.	xxx
13...	F..	3 yrs..	O. M. S. Ac...	1 week	Mastoiditis. Operation	
14...	F..	7 yrs..	...do .....	...do ..	Mastoiditis. Operation	
15...	M.	25 yrs.	...do	2 weeks.	One month after onset returned with Ac. mastoiditis. Operation.	xx
16...	F..	8 mos.	...do .....	...do ..	Left ear	
17...	M.	18 mos	O. M. S. C....	1 mo...	Right ear	
18...	M.	9 mos.	...do	2 mos..	Two bros. dead of diphtheria.	x
19...	F..	27 yrs.	...do	Years ..	One sister died of pneumonia.	xx

Case.	Sex.	Age.	Disease.	Duration.	Personal or family history.	Reaction.
20...	M.	4 mos.	O. M. S. Ac...	4 days..	Right ear	
21...	M.	5 yrs..	...do	Years ..	Refuses to heal after months of treatment in hospital.	xx
22...	M.	7 yrs..	Acute Mastoiditis.	.....	Operation. Has a tubercular hip. Now discharging.	
23...	M.	5 mos.	O. M. S. Ac...	4 days..	Healed promptly.	xx
24...	F.	7 yrs..	O. M. S. C....	Years ..	Both ears. Father died of tubercular laryngitis one year ago	xx
25...	F.	10 yrs.	...do	2 yrs...	Maternal grandmother died of tuberculosis. Father dead.	xx
26...	F.	5 yrs..	...do .....	..do ...	One aunt has t. b.	x
27...	F.	18 yrs.	Ac. M. Fac. paralysis.	Few days	Operation right ear. Father and mother died of tuberculosis.	x
28...	F.	22 yrs.	O. M. S. C....	2 yrs...	Both ears. Tobacco worker.	xxxx
29...	F.	31 yrs.	...do	25 yrs..	.....	xx
30...	F.	9 yrs..	...do	2 yrs...	One sister and one aunt have t. b.	xxx
31...	M.	9 yrs..	O. M. S. Ac...	Few days	.....
32...	F.	31 yrs.	O. M. S. C....	25 yrs..	A brother and an uncle died of t. b.	x
33...	F.	1 yr ..	Ac. Mas.....	.....	Operation. Scarlatina 3 weeks ago.	
34...	F.	5 yrs..	O. M. S. C....	Years ..	Radical operation.....	xxx
35...	F.	5 yrs..	Ac. Mas.....	.....	Operation.....	
36...	F.	7 yrs..	O. M. S. Ac...	Few days	Right ear. Ran for three days last year.	
37...	F.	4 yrs..	O. M. S. C....	3 weeks.	Both ears. Have run for two years intermittently. Has a tuberculous ankle.	xxx
38...	M.	4 mos.	O. M. S. Ac...	1 week ..	Both ears	
39...	F.	4 yrs..	O. M. S. C....	4 yrs...	Right ear	x
40...	F.	6 yrs..	O. M. S. Ac...	1 week ..	Right ear. Father died t. b. one year ago.	xx
41...	M.	2 yrs..	...do	1 day ..	Right ear.....	
42...	F.	2 yrs..	...do	1 week ..	Right ear. Father's sister has t. b.	
43...	F.	13 yrs.	...do	3 weeks.	Ear ran for 12 months two or three years ago.	xx
44...	M.	2 yrs..	...do .....	..do ...	Left ear. No treatment..	
45...	M.	7 yrs..	O. M. S. C....	6 yrs...	Father died t. b. hemorrhages at 31. Mother sickly.	xx
46...	F.	7 yrs..	...do	Months	Left ear	xx
47...	F.	15 mos	O. M. S. Ac...	Few days	Both ears. Measles, just recovering.	xx
48...	M.	8 yrs..	...do .....	.....	Mother and aunt had t. b.	xx
49...	M.	1½ yrs.	...do	1 yr....	Left. Post scarlatinal. Has adenoids.	
50...	F.	8 yrs..	O. M. S. C....	Years ..	Both ears. Measles and pertussis. Uncle died of t. b.	x

SUMMARY.

Of the twenty-nine chronic cases, twenty-seven gave positive reactions, and in fourteen of these there was a positive tubercular family history. The two giving negative results were infants eighteen months old also with tubercular family history.

Of the fifteen acute cases, four gave positive reactions and eleven negative. Of those giving positive reactions, one patient aged twenty-five, returned in one month and was operated for mastoiditis. Another, aged six, died of tuberculosis one year ago. A third patient, aged thirteen, had O. M. S. C. for one year two years ago.

Of the eleven negative cases, all gave negative family histories.

Of the six acute mastoid cases, two gave positive reactions and four negative. In one case an aunt had tuberculosis. The child was two years old when otitis developed. In one case the father and mother died of tuberculosis, the other had a discharging tuberculous hip.

Of the four cases giving negative results, there was no tuberculous history in any case.

57 WEST SEVENTY-SIXTH STREET.

TWO CASES OF EPIDEMIC CEREBROSPINAL MENINGITIS TREATED BY SPINAL INJECTIONS OF ANTISERUM.*

BY

SAMUEL S. ADAMS, A. M., M. D.,

Washington, D. C.

THE phenomenal reduction of the mortality of epidemic cerebrospinal meningitis by the injection into the spinal canal of an antiserum, prepared by Simon Flexner at the Rockefeller Institute for Medical Research, has prompted me to report two cases that have recently been treated by me in the Children's Hospital, District of Columbia. One would not presume to form a decided opinion from two cases, but would be warranted in further trials with a remedy that offers some hope of cure in a malady that has hitherto been regarded as almost always fatal.

An interesting paper by Flexner and Jobling on the Serum Treatment of Epidemic Cerebrospinal Meningitis is to be found in the *Journal of Experimental Medicine*, vol. x, No. 1, January,

*Read at the Washington Obstetrical and Gynecological Society, March 20, 1908.

1908. Of forty-seven cases of epidemic cerebrospinal meningitis treated by Flexner's antiserum, thirty-four recovered and thirteen died—recovered, 72.3 per cent.; died, 27.6 per cent. Of the thirteen fatal cases, four were either of the fulminant type, in which death occurred within thirty-six hours of the onset, or the patient was *in extremis* and died a few hours after the injection of the antiserum. These authors feel justified in excluding from their statistics the four cases mentioned, as benefit from the antiserum could hardly have been expected. The result then in the forty-three cases is thirty-four recoveries and nine deaths.

The authors give general instructions for the use of the antiserum, but I will not quote at length.

"The antiserum is to be introduced directly into the spinal canal after the withdrawal of cerebrospinal fluid by means of lumbar puncture.

"The quantity of serum to be used at a single injection should not exceed, for the present, 30 c.c. It is desirable, although it would not appear to be essential, to withdraw from the spinal canal at least as much fluid as the amount of antiserum to be injected. The injection should be made slowly and carefully to avoid the productions of symptoms due to increased pressure. This precaution should be exercised especially when the quantity of cerebrospinal fluid withdrawn is less than the amount of antiserum to be injected.

"The injection of the antiserum should be repeated every twenty-four hours for three or four days or longer. Whether any advantage will be gained by more frequent or more numerous injections than here indicated, a wider experience must decide. As much as 120 c.c. of the antiserum have been injected into the spinal canal in four days without causing unpleasant symptoms.

"The evidence at hand indicates that the earlier in the course of the disease the injections are made, the better the results. Hence, should the film preparation prepared from the first fluid obtained by spinal puncture show Gram-negative diplococci; some of which are leukocytes, an injection of the antiserum should be made immediately and without waiting for the result of culture tests. Should the diagnosis be left in doubt or the disease prove later to be of another nature than epidemic meningitis, no harm will have been done by the injection of the antiserum."

CASE I.—G. T. aged three years, colored, was admitted to the Children's Hospital, District of Columbia, February 15, 1908.

It was impossible to obtain any knowledge of her antecedents.

Present Illness.—She was in excellent health until February 9, when she vomited, became stupid and refused nourishment; and has remained in the stupid condition since that date. On the 10th and 11th she paid no attention to her surroundings, but occasionally asked for water. Since the 11th she has not noticed anything. When moved she would cry; and has had stiffness of neck muscles with the head drawn back. She has not had any convulsions. I saw her a few hours after her admission when she was comatose. Opisthotonos was marked, there was general hyperesthesia, and an attempt to move the head caused a loud cry and a general muscular tremor. Kernig's sign was present, being more marked on the right side.

A physical examination excluded those conditions which might be the cause of the meningeal symptoms and I concurred in the diagnosis made by Dr. Abbe (who sent her to the hospital) of epidemic cerebrospinal meningitis.

At 7.30 P. M. 30 c.c. of clear fluid were withdrawn and 15 c.c. antiserum injected into the spinal canal. This spinal fluid was negative.

February 16. As the child's condition was not any better, lumbar puncture was done, but only 2 c.c. escaped. The resident physician would not assume the responsibility of injecting antiserum.

February 17. Very restless during the night and this morning. Rigidity as marked. Opens eyes when disturbed, but only semi-conscious. Difficult to give food.

At 11 A. M. lumbar puncture was done, but no fluid was obtained, although suction was used. I did not inject the antiserum because the diagnosis was uncertain as to the variety of the meningitis, and also because of the danger of increasing the intracranial pressure already indicated by widely dilated pupils and less muscular rigidity. Indeed, tuberculous meningitis now seemed probable. Two and a half hours later the child gave evidence of collapse and had to be stimulated with hypodermatic injections of strychnia.

February 18. Rested better, was quieter than during the previous night and is brighter this morning. She slept quietly most of the day, and took twenty-five ounces of liquid food. Leukocytes, 17,000. At 4 P. M. temperature had fallen to 100.6° F.

February 19. Slight improvement noticed. She was in a stupor most of the day, but occasionally roused and seemed brighter.

February 20. Talked a little.

February 21. Brighter and does not complain of pain. Opisthotonos has disappeared, as well as the general hyperesthesia.

February 22. All the nervous symptoms have disappeared, asked for a doll, talks freely and begs for food.

From this time her general condition steadily improved and she was discharged cured March 8, 1908.

The uncertainty of the pathological diagnosis in this case at first deterred me from reporting it, although the clinical features were surely those of some form of meningitis. However, after reading the reports of the cases published by Flexner and Jobling, and noting the resemblance of the clinical phenomena in my case to several of those, I am emboldened to record it as one of epidemic cerebrospinal meningitis terminating by crisis after the administration of antiserum.

CASE II.—F. T., age five years, white, was first seen by me on the morning of February 11, 1908, at the request of Dr. P. S. Roy. The previous day he had been playing about the yard, and ate his dinner as usual, although he complained of headache. A short time after dinner he vomited and at 9 P. M. his mother found him on the floor in a convulsion; at 11.30 P. M. he had the second convulsion. Dr. Roy gave him an injection of morphia, which quieted him for the night. Early on the 11th, Dr. Roy made a diagnosis of epidemic cerebrospinal meningitis. My examination showed marked stupor, normal pupils, rigidity of cervical muscles, Kernig's sign and petechiæ over the entire body. At this time the pulse was slow, the temperature (rectal) 101° F.; he was easily roused, but dazed; asked for the chamber and passed the normal quantity of urine. He lay down and was soon asleep.

Another consultation was held at 5 P. M., when his condition was worse, the stupor being profound. I concurred in the diagnosis, so we advised his immediate removal to the Children's Hospital, District of Columbia.

His family history is excellent, he had measles when six months old, but has been a healthy child since. Stupor is now marked, but he can be aroused by shaking. Small petechial eruption over body and extremities. Internal strabismus of the right eye, ptosis of eyelids. Pupils contracted, left more so, react to light. Conjunctival injection of left eye.

Heart normal; pulse rapid. Respiratory system normal. Digestive, osseous and glandular systems normal. Nervous system: stupor; tremor of arms and legs; slight opisthotonos; hyperesthesia, Kernig's sign present; patella reflex absent. Muscular system: muscles of extremities relaxed, those of neck contracted. He throws his arms about, but does not move his head or change his position.

At 8 P. M. I removed 32 c.c. of spinal fluid, which was milky in appearance, and immediately injected 30 c.c. of antiserum, which had been kindly given by Dr. Flexner. The fluid withdrawn showed diplococci intracellularis.

February 12. More restless and cries out frequently. Takes food by force, owing to difficulty in swallowing. Extremities frequently become rigid and then relax.

P. M. No difficulty in swallowing, seems to be in pain, grits teeth; pupils more dilated, urine normal.

February 13. Had a fair night. General condition better.

Petechiæ fading. Thirty c.c. fluid drawn and 15 c.c. injected. Diplococci not so numerous and fluid clearer. Later in the day he showed signs of mental improvement. Leukocytes, 28,200.

February 14, A. M. Improvement; no pain, and shows signs of consciousness.

Seven P. M. Very restless and in great pain. Only slight movement of left arm; right moves freely. Pupils dilated, but react promptly. Thirty c.c. fluid removed and 15 c.c. antiserum injected. Diplococci present, but not so numerous.

February 15. Cannot turn owing to rigidity of neck. Opisthotonos present. Rash has disappeared. Spasms of facial muscles. Turned himself. Leukocytes, 26,400.

February 16, A. M. Protrudes tongue when asked to do it. Convulsion of left arm and leg severe, requiring two injections of morphia.

P. M. Twenty-two c.c. fluid removed and 15 c.c. antiserum injected. Diplococci in small numbers found. Leukocytes, 29,800.

February 17, A. M. Tremor not so severe.

P. M. Tremor absent. Improvement general except in left arm which he has not moved during the day, but moved it at night.

February 18, A. M. Improved. Slight tremor of left hand and arm, but none of face.

P. M. Talked for the first time and answered questions intelligently and asked for food. Leukocytes, 42,400. Had eleven convulsions, followed by continuous twitching. About 3 P. M. became conscious, smiled and answered questions by shaking his head.

February 19. Opisthotonos marked, and twitching of muscles of face. Late in the day asked to be raised to drink his milk. Used his left hand several times. Said his "whole self hurts." Answers questions rationally, but at times talks at random.

February 20. Opisthotonos less. Moaned and complained of pain, and was perfectly conscious. Had a chill. At 4.30, 25 c.c. fluid withdrawn and 15 c.c. antiserum injected. Soon after this injection he became unconscious and all twitchings ceased. Less diplococci found. Leukocytes, 59,200.

February 21. During the early part of the day he was very quiet and apparently unconscious; but later in the day answered questions.

February 22. Chills and talks rationally. Six c.c. thick, flaky fluid withdrawn and 15 c.c. antiserum easily injected. A few diplococci present.

February 23. No change noted, except that he seems weaker.

February 24. Sleeplessness and cries from pain. Latter so severe that he had morphia twice during the day. Twenty-five c.c. of thick, cloudy fluid withdrawn and 15 c.c. antiserum injected. Diplococci present. One chill and one convulsion. More conscious.

February 25. Slept ten hours; had two chills and much twitching.

February 26. Conscious most of the time and complains of pain. Continuous twitching of facial muscles. Twenty-five c.c. of a thick, flaky fluid withdrawn and 15 c.c. antiserum injected. Leukocytes, 57,400. Diplococci present.

February 27. Has grown weaker during the day and at times was in collapse, but revived after stimulation. No convulsion and only slight twitching occasionally.

February 28. Partial paralysis of left side; pupils widely dilated and react only sluggishly to lighted match.

February 29. Slight cyanosis of face and body; paralysis of left side more marked; pupils very dilated and only slight reaction. At 5 P. M. 22 c.c. fluid withdrawn and 15 c.c. antiserum injected. Fluid thick and creamy and contained diplococci.

He died at 6.05 P. M. No necropsy.

An analysis of this case will show that 217 c.c. of cerebrospinal fluid were drawn from and 150 c.c. of Flexner's antiserum injected into the spinal canal during a period of eighteen days. The more closely I study the case, the more I am convinced that the boys' life would have been saved had the 30 c.c. been continued every day for probably the first week. Indeed, I am now convinced that there was too much fear of doing him harm by injecting the fluid in too large quantities or too often. One must be impressed by the rapid and marked benefit of the first injection, which should have encouraged us to repeat that dosage, and yet it must be confessed that timidity in the use of a remedy on trial led to small dosage. On one occasion it looked as if the injection might have been responsible for a convulsion, but as the boy had had convulsions on the previous day when no injection was given, and as the one this day occurred nearly two hours after the injection, it must not be attributed to either the antiserum or the pressure. The boy took at least two quarts of milk daily, so that his nutrition was maintained throughout the illness.

These cases were carefully watched, the latter having special nurses, so that everything was promptly recorded and reported to the house staff. The greatest interest was manifested in the cases, and I now acknowledge my indebtedness to the house staff and the nurses for their assistance.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

Twentieth Annual Meeting held at the Water Gap House, Delaware Water Gap, Pennsylvania, May 25, 26 and 27, 1908.

The President, CHARLES G. KERLEY M. D., of New York, in the Chair.

THE SERUM TREATMENT OF EPIDEMIC CEREBROSPINAL MENINGITIS.

Dr. SIMON FLEXNER (by invitation) presented briefly some of the figures which he had lately collected relating to the treatment of cerebrospinal meningitis by means of the antimeningococcus serum.

It was just one year since the serum was first used in this country; during the course of this year the serum had been used, but to a less extent, in Great Britain. Therefore, he was obliged to bring before them statistics based upon less than 400 cases of epidemic cerebrospinal meningitis which had been diagnosed bacteriologically and clinically and in which the serum treatment had been employed. During the course of the year they had modified somewhat the manner of its application, and had learned to use it in larger doses and at more frequent intervals. He believed that the statistics gained during the last three or four months would compare favorably with those of the first six or eight months, showing a higher percentage of recoveries than the first series. A part of the advantage came from a dissemination of the knowledge that there was such an agent as the serum which had a beneficial effect in the treatment of the disease. This had enabled them to employ the serum earlier. Recently some gentleman had told him that he now saw the cases earlier and the results of the serum treatment had been correspondingly better. It was of importance to consider whether or not the serum was useful early or later in the same or different degrees. If the serum was active, they did not know how it acted; it belonged to a class of bacteriolytic sera. The capacity to neutralize that the serum possessed was small. The pure antitoxic value of the serum was possibly not great. On the other hand, there were evidences at hand to show that the serum exerted a distinctly injurious effect upon the vitality and viability of the meningococcic germs present in the cerebrospinal canal. After the injection of the serum directly into the canal it was impossible to grow the microorganisms. There was a diminution in the microorganisms soon after the injection was given; the chief advantage gained by the injection was from the injury inflicted upon the microorganisms.

Dr. Flexner's figures were based upon 322 cases of the disease treated with the serum here and abroad. There were 247 treated in this country; of these 68 died and 147 recovered, giving a mortality of 27 per cent. They made no selection of their cases; this was a point he wished especially to emphasize. The cases treated were the late and desperate ones as well as the milder. Those cases that came under treatment in the third week were unfavorable; the mortality was higher than if they came under treatment in the first week. Sometimes the patients underwent a marvelous change as a result of but one or two injections of the serum. Most striking results were seen in some of the desperate cases. In not a few cases the lumbar puncture, with serum injections, entirely changed the character of the disease and the patients went on to a prompt recovery.

In analyzing these 247 cases according to years, there were thirteen under the age of one year; of these five died and eight recovered, a mortality of 37.5 per cent. There were twenty-six cases between the ages of one and two years, with a mortality of 37.5 per cent. Forty-five were between the ages of two and five years; these gave a 22 per cent. mortality. There were sixty-three between the ages of five and ten years, with a 11 per cent. mortality. There were fifty-seven between the ages of ten and twenty years, with a mortality of 28 per cent. Forty-four were over the age of twenty years, and gave a mortality of 45 per cent. Whereas the average case got well gradually, the recovery extending over a period of days or weeks, he was impressed when he first analyzed the effects of the serum treatment with the fact that a certain number of the cases terminated with remarkable abruptness, and this was what he meant by stating that the disease terminated by crisis. Perhaps the use of the word abrupt would be better. He wished to emphasize the fact that there did occur in this disease what occurred, fortunately, in the natural course of the disease when treated by other means—a sudden and abrupt termination, with entire disappearance of all the symptoms.

Seventy-five of the cases were collected from Great Britain, and there the mortality was about 30 per cent. The previous mortality, without the use of the serum, varied from 75 to 80 per cent.

Dr. Flexner presented charts showing the terminations by crisis and by lysis. What he presented were merely facts. In a disease as serious as was cerebrospinal meningitis, no therapeutic agent should be adopted as being of great value too soon. It should first be subjected to the most rigorous tests. Judgment should be withheld until the conclusion was reached that the agent was in truth a valuable one. The persons to decide this question were those who observed the disease before and after injections of the therapeutic agent. The serum influenced the clinical course of the disease very markedly; but just how it acted he was unable to state.

THE DIAGNOSTIC VALUE OF THE CHEMICAL AND BACTERIOLOGICAL EXAMINATION OF CEREBROSPINAL FLUID.

DR. ALFRED HAND, JR., of Philadelphia, said that to-day lumbar puncture furnished a means of making an exact diagnosis. But the fluid obtained by lumbar puncture must always be examined with great care in order to arrive at a correct interpretation. Typical cases presented well-marked findings. Thus, if the fluid from a case of meningitis showed a milky opalescence, which disappeared as the fibrin net-work formed, leaving a clear fluid containing a great increase in the normal amount of albumin, and with the presence of sugar but little, if any, below the normal percentage, the fibrin net-work also being found to contain mononuclear leukocytes and tubercle bacilli, the diagnosis was clear—a tubercular meningitis. If the fluid was distinctly turbid, with sometimes a slight yellow tint, and polymorphonuclear leukocytes are found in abundance, some of them containing in their protoplasm diplococci, the diagnosis was established of epidemic cerebrospinal fever. After the fibrin net-work had formed and been withdrawn, a further study of the fluid would show a moderate increase in the amount of albumin and a total absence of sugar. A meningococcic meningitis gave a very similar fluid, with occasionally greenish-yellow tint, as in streptococcic or staphylococcic meningitis, but the diplococcus in this form was hardier even, the pus-cells being very abundant in the fluid. It was important to start the examination as soon as possible after the fluid had been obtained. The fact that a tuberculous form was associated with the presence of sugar and an almost total absence of polymorphonuclear leukocytes, while the reverse held for other affections, led him to think that there was some relation between the two. A further report would be made upon this.

HYDROCEPHALUS OF MENINGOCOCCUS ORIGIN, WITH REMARKS ON THE SERUM TREATMENT.

DR. J. H. MASON KNOX, JR., and DR. FRANK J. SLADEN, of Baltimore, presented this paper. In the literature a comparatively small number of cases had been reported. Incident to the onset of hydrocephalus, the character of the symptoms seemed to become masked and the clinical picture in many cases was not recognized. In a review of the subject by Joslin some years ago, he found a case reported in 1805 in which cerebrospinal meningitis was found in an individual, with marked dilatation of the ventricles. Numerous instances had been reported of hydrocephalus following meningitis. Ziemsens, in 1874, published an extensive description of the complication, and his pathological description was almost up-to-date. They then referred to some cases which had been reported in the literature. There were many cases reported in which mental impairment was noted.

They called attention to the histories of two cases treated during the winter and fall.

CASE I.—This was a child, five months old, and was seen in consultation. The child was perfectly normal at birth and for two months after. Then it developed a marked gastroenteritis, the illness lasting seven weeks before the doctor saw her. She was then seized with general convulsions, which were followed by vomiting and fever. After two weeks, these symptoms abated and the fever lessened. Retraction of the head was noticed. Inspection showed a child with the typical pressure symptoms of meningitis, with bulging fontanel with the bones of the skull separated and sutures gaping. The circumference was 44 cm. Lumbar puncture removed 100 c. c. of a slightly turbid fluid, in which a rather small number of organisms were found. There were present numerous pus-cells. The child did well for a few days. One week later, a second puncture was done, a similar amount of fluid being removed, with practically the same result. Serum was advised but refused by the family. After the second lumbar puncture improvement followed. One month later the father asked for a nursery maid because of the great improvement in the child. However, a few weeks later and quite suddenly the child died and autopsy was refused.

CASE II.—This was a child, aged six months. One of the children had been taken to the milk dispensary in Baltimore and was found to be a markedly emaciated child with retracted head, but the head was evidently hydrocephalic with bulging fontanels. There was no history for the condition. The child was said to have had a fall, but there was no history given of any acute illness. The left side of the head bulged more than the right. The skin about it was a little redundant. It did not appear to have a typical hydrocephalus. A tumor with pressure symptoms was suspected. A lumbar puncture with a dry cut was done. Then a ventricular puncture was done and 20 c. c. of a slightly turbid fluid was removed. The pathologist found a large number of meningococci, both extra and intracellular. He then learned that four months previous the child would awaken at night and moan as if in great pain. There were frequent convulsions. For four days and nights the child cried constantly. The eyes were crossed. The head began to increase in size five weeks before admission. The circumference was 46.5 cm. The head was retracted and the neck was held stiff. A second lumbar puncture was made, but no fluid obtained. While in the ward the child improved somewhat. Five intraventricular punctures were made, and the child withstood the tappings very well. He ran a slightly irregular temperature from 97° to 101°, respiration ran from 24 to 40 and pulse from 100 to 150. The child finally collapsed and died. No autopsy was allowed. The symptoms in the cases varied with the age and history. There was a lessening of the number of cases of hydrocephalus as a result of the use of the serum treatment.

CASE III.—They wished to report another case, that of a boy, fifteen years of age, who had been ill ten days before first being seen. He was found in the typical posture of meningitis, was delirious and unconscious. This case was one which one would believe would prove fatal. It represented the kind of case Dr. Flexner would show might get well by lysis. Six punctures were done, and a turbid fluid obtained. Treatment was instituted with improvement. There was a marked strabismus. Otitis media developed and a paracentesis was done on both membranes.

CASE IV.—This was a child of seven years, who was seen rather early in the disease and who received two doses of the serum. After the first dose there was a marked improvement; after the second dose, convalescence occurred, and the patient was discharged on the thirty-fifth day of the disease.

With regard to other cases, Dr. Sladen went over them all. There were thirty-three cases before this year; of these twenty-one died and twelve recovered, giving a mortality of 64 per cent. The lowest mortality for one year occurred in 1899—43 per cent. In 1906 occurred the highest mortality—100 per cent. In 1899 they began the use of lumbar puncture. During the last four and a half months, twenty-one cases had been admitted, and in all the meningococcus was demonstrated. All of these twenty-one cases were treated by lumbar puncture and intraspinal injections. Three died and eighteen recovered—a mortality of 14 per cent. and a recovery of 86 per cent. The three cases that died were all of a very virulent type. Twelve cases were under twelve years of age, eleven died and one recovered. Of ten cases seen previous to this year and under twelve years of age, four died and six recovered—a mortality of 40 per cent. Most of the cases were temporarily upset by the injection of the serum.

THE SERUM TREATMENT OF CEREBROSPINAL MENINGITIS, WITH A REPORT OF CASES.

DR. CHARLES HUNTER DUN, of Boston, made this report of a series of forty cases, occurring consecutively, treated by the Simon Flexner serum. All cases in which the diplococcus was found, without regard to type, were included. Sixteen occurred in the Children's Hospital; sixteen in private practice; while eight occurred in the various other hospitals. The serum was administered in all cases in the cerebrospinal canal. As soon as a suspected case was reported lumbar puncture was performed. If the cerebrospinal fluid was cloudy, the serum was used at once. If the fluid was clear, no antiserum was given unless a subsequent test revealed the presence of the diplococci. In those cases in which a rapid and marked improvement occurred after the first injection, no further injections were given. In those cases in which this did not occur, the injections were repeated until the nervous and subjective symptoms were com-

pletely relieved or until four injections were given. In the relapsing cases, further treatment was given. The routine amount given was 32 cm. 45 cm. being the maximum. Of these forty cases, nine died and thirty-one recovered—a mortality of 22.5 per cent. Twenty-nine of the cases were now entirely well. The significance of these figures pointed to the value of the serum as objective, and, on the ground that as the mortality of the disease presented wide variations at times, these cases might present the milder types occurring in Boston. Clinically, the type of the disease was not milder than those occurring previously. All types were included in these cases. There were three fulminating in type, with one death; six were severe in type, with two deaths; nineteen cases ordinary type, with one death; six were mild cases, with no deaths; and six were late cases in the chronic stage, all unconscious when seen, with five deaths.

Up to 1903, the systematic treatment employed was lumbar puncture, four or five times; this was the therapeutic measure largely employed. It was used in all cases at first. In 1906, the cases were treated with the diphtheria antitoxin, given daily; this was practically all the treatment given. In 1907, all the cases were treated with vaccine prepared from the diplococcus. On November 1, they started using the serum. This year there occurred a tremendous drop in the mortality rate to 19 per cent. Marked and striking effects were produced as the result of the serum treatment in individual cases; it apparently modified and changed the course of the disease. There were three particular effects produced: first, a fall in the temperature; second, a rapid improvement in the condition, accompanied by a marked relief of certain symptoms; third, it cut short the course of the disease. There was a disappearance of the mental dullness or headache and other subjective symptoms after the use of the serum, and this resulted quickly. The rigidity of the neck muscles and König's sign were very persistent. Strange to say, the children played in the wards with this rigidity of the neck muscles. There was immediate improvement in eighteen cases; no improvement in five. The duration of the symptoms was cut short, as a rule. All the symptoms disappeared at the end of one week in ten out of the forty cases; at the end of two weeks in seven cases.

Another marked effect was seen in the successive examinations of the cerebrospinal fluid. After one injection of the serum one almost invariably saw a smaller number of the organisms and many more were seen in the cells. After the third injection, it was rare to see any outside the cells at all. After the fourth injection, no organisms were seen at all. In cases of relapses, they kept on giving the serum until no organisms appeared in the fluid. The use of the serum prevented relapses, as a rule.

The result obtained depended upon how early the serum was used. The mortality with the use of the serum in the first week was 8 per cent.; after the second week, 77 per cent.; after the third week all died.

THE SERUM TREATMENT OF EPIDEMIC CEREBROSPINAL
MENINGITIS.

DR. F. S. CHURCHILL, of Chicago, reported the histories of eleven cases, nine of which were meningococcic in type. Of the eleven cases, four died. One of these four was a girl of sixteen years and was brought to the hospital on the tenth day of the disease and practically moribund. A second case was a man of twenty-five years and was brought in on the fifth day of the disease. The serum had no effect whatever in this case. What he had to say he would devote to the seven cases that recovered, illustrating each case by charts. The observations were made upon the effect of the serum upon the general condition, the temperature, the leukocyte curve, the spinal fluid as to leukocytes, bacteria, etc.

CASE I.—This was a boy of fourteen years and was seen on the sixth day of his disease. The first puncture was done on the sixth day, and without any effect upon the temperature. The day following, the serum was again given with a decided drop in the temperature and a cessation of the symptoms by lysis. The dose given was 20 c.c. The leukocytosis kept up; the count was at first 15,000, and ran as high as 20,000.

CASE II.—This was a boy of sixteen years, who came in on the second day of his disease with a temperature of 102. When the puncture was done the temperature was 106.5. No serum was given. A drop in the temperature followed the puncture, with a rise later. Then three successive doses of the serum were given, with a sudden drop and a failure to rise again. The leukocyte curve had a varied course.

CASE III.—This was a girl of nine years, a very severe case. The puncture was done on the first day of her disease, with a marked drop in the temperature. The serum was given on the second and fourth days, 30 c.c. at a dose. The termination of this case approached what Dr. Flexner has called crisis.

CASE IV.—This was a boy, nine years old, who was admitted to the Presbyterian Hospital on the twenty-first day of the disease. This was a rather severe and protracted case. The serum was given only every other day, 15 c.c. each time. On the twenty-ninth day, there was a jump in the temperature, the leukocyte count, and a corresponding increase in the leukocytes in the cerebrospinal fluid. There was a general increase in the details of the clinical picture. The boy was then given three successive doses of the serum and the temperature returned to the normal. This was a very chronic and persistent case, probably due to the fact that they did not get hold of the case before the third week of the disease. The patient made a complete recovery.

CASE V.—This was a woman treated at the County Hospital. Lumbar puncture was done on the twenty-first day of the disease. The temperature dropped, but promptly rose again.

After being in the hospital five days with the temperature constantly up, the serum was given, 30 c.c., and this was accompanied by a drop in the temperature without subsequent rise. There was also a drop in the leukocytic count after the serum was used.

CASE VI.—This patient was a Greek, nineteen years old, a very severe case. The patient entered the hospital on the first day, and the serum was administered on the second and fourth days, respectively, 30 c.c. being the dose. There was a fall in the temperature after the first injection and a rise next day. There was a gradual fall in the leukocyte count to the normal. A lordosis made the spinal puncture a rather difficult procedure.

CASE VII.—This patient was ten years old, and was an exceedingly severe case. The general clinical picture was that of a very sick child. Successive doses of the serum were given for three days, with good results on the temperature. But the patient was still running a leukocytosis—29,000, then 16,000, up to 25,000 and so on. A careful examination of all parts of the body revealed nothing to account for this leukocytosis.

DR. CHURCHILL said that the general impression left upon him was that a marked improvement followed the use of the injections of the serum. This improvement not necessarily followed after the first, but after the second or third dose. There was particularly a marked improvement in the mental condition. It was very interesting to see the children with marked retraction of the head, yet interested in the surroundings, the work and play of the others in the wards.

As to the character of the fluid, there had been a decided drop in the number of leukocytes in the fluid at the time of the second, third or fourth puncture, accompanied by a corresponding drop in the number of diplococci. This had been constantly noted.

With the exception of two, all the patients recovered without sequelæ. One patient had a mild nephritis when he came in, but this was not increased any in intensity, and he left the hospital apparently well. Another case ran a leukocytosis; possibly there was some mischief whereof they knew nothing.

Dr. Churchill personally believed that, given a case of evident meningitis, it was obligatory to do a lumbar puncture; if the fluid removed was cloudy, the serum should be injected at once, and one could wait for a future investigation to determine what the type of meningitis was. He emphasized the importance of repeating the dose day by day until good results were obtained.

OTHER METHODS OF TREATMENT COMPARED TO THE SERUM TREATMENT OF CEREBROSPINAL MENINGITIS, WITH A RESUME OF CASES OF BOTH METHODS OF TREATMENT.

DR. HENRY KOPLIK, of New York, said that in considering the various forms of therapy of cerebrospinal meningitis (meningitis meningococcic) we should not lose sight of the natural course

of the affection, and in no disease was this more necessary than in cerebrospinal meningitis. This disease, as Osler had pointed out, resembled very closely in its behavior pneumonia. It occurred sporadically and in epidemics. He thought that anyone would admit, if he had passed through many epidemics of cerebrospinal meningitis, that in the sporadic cases we rarely met with the severer forms of the disease. It must be admitted, therefore, that while on the whole, the symptomatology of the sporadic and epidemic forms of the disease were exactly similar, the sporadic ran a much milder course than did the epidemic form of the disease. Lumbar puncture in the sporadic form only exceptionally revealed a purulent fluid at the onset.

Taking up the sporadic form of meningococcic cerebrospinal meningitis, he said he had been fortunate enough to have the records of cases treated since 1899 up to the epidemic years of 1904-1905. He first began the systematic treatment of cerebrospinal meningitis in 1899: this consisted in a careful study of the symptoms and lumbar puncture repeated as often as they found symptoms to warrant it. The cases were punctured two, three, four or five times, as necessity called for. During 1899-1900, they had eight cases of the meningococcic type. During 1901-1902-1903, they had thirteen cases, thus giving twenty-one sporadic cases. Eight died, a total mortality of 38 per cent. Of these eight cases, six were below one year of age. Out of twenty-one cases, two infants below one year of age recovered, and two recovered between the ages of one and two. In the epidemic of 1904-1905, the history of the disease was a more violent one. Some died a few hours after admission. The first epidemic year was in 1904. There were thirty-nine cases and twenty-one deaths, a total mortality of 53 per cent. Of these twenty-one cases that died, thirteen were below the age of two years. Deducting these thirteen cases from the total of thirty-nine, would leave twenty-six cases above the age of two years, of which nine died, a mortality of 34 per cent.

In 1905, there were thirty-five cases, of which seventeen died. The total mortality for this year was 48 per cent. Of the seventeen deaths, ten were below two years of age.

Thus, in the two epidemics of 1904-1905, they had fifty-one cases above two years of age, with a mortality of 31 per cent; and, considering the patients below two years of age in the mortality, the total mortality would be 50 per cent. They had twenty-three cases in these two years below two years, of which 78 per cent. died while the remainder were unimproved.

From a study of these two sets of statistics—one the sporadic cases of cerebrospinal meningitis, the other of the epidemic form—in the sporadic cases they had succeeded in saving by simple lumbar puncture four children below two years of age; while in the epidemic form they had succeeded in saving none.

Considering cerebrospinal meningitis treated by the serum therapy, he offered thirteen cases. With the exception of the ap-

plication of the serum, they were treated identically as the cases he had just been speaking of. No patient was punctured in cerebrospinal meningitis unless there were distinct indications for the puncture. To be punctured a patient must show symptoms of pressure and indications of cerebrospinal fluid. The serum was introduced not by a syringe, but by a funnel. The ages of these thirteen children varied from three and a half months to eleven years. Three were below one year; three were two years or younger. Two of those below one year of age died, one which recovered was ten months of age.

Among those children below one year of age who died, the youngest three and a half months, had been ill two weeks on admission, and she was unconscious on admission. This child received from 100 to 125 c.c. of serum.

Another case which was discharged with hydrocephalus was above one year of age and cannot be said to have been cured. Thus, of thirteen cases, ten were discharged cured, two died and one had hydrocephalus.

DISCUSSION OF CEREBROSPINAL MENINGITIS.

DR. L. EMMETT HOLT, of New York, said that statistics had been collected of 2350 cases in the epidemic of 1904 in New York and that the mortality of all nonserum treated cases was 75 per cent. The statistics in regard to the cases that recovered were interesting. Of 350 cases, the duration of which was known, 50 per cent. lasted five weeks or longer. During the epidemic years they had treated eighty-three cases and lost every case under one year of age, no matter what the type of the disease, frequency of lumbar puncture or any other measures. There had been so few cases during the past year that he had not met many. One child of five months got well. Dr. Holt thought the material reported was encouraging.

DR. THOMAS MORGAN ROTCH, of Boston, had had a good opportunity to watch these cases and was very loath to speak of epidemic cases and sporadic cases. The disease might differ in type, but not in any essential way. It was ruled by the organism. They had in their wards tried all sorts of treatment in various successive years, and had come to the conclusion that it was absolutely safe to give the injections. He thought this was an important point because it was sometimes said that it was not right to give them. This was too serious a disease to waste time in waiting. One already knew what would happen if he waited. He thought it absurd not to give the injection at once when we knew it could do no harm. Lumbar puncture certainly did do good at times, temporarily. It gave benefit by relieving the pressure. Drawing off a considerable amount of the fluid lessened the number of organisms in the blood, but there were still a large number to get in their damaging work. They had found that the vaccines raised the opsonic index, although they did not

seem to be curative in any way. Something might be done with the vaccines, but not so much as with the serum. There was no doubt but that we should repeat the dose and at times give an injection twice in twenty-four hours. In some cases, where the child was practically dying, immediate relief was given by the injection of the serum. There was some prejudice against repeating the dose within a short time and the symptoms soon returned. It seemed to be the consensus of opinion of this society that the treatment should be pushed. Dr. Rotch thought that in this way many of the sequelæ might be saved. The youngest case he had seen was twenty-four hours old and died on the second day.

DR. FRANK J. SLADEN, of Baltimore, said that in twenty-two cases in Dr. Barker's clinic the effect of the serum treatment had been about as described by Dr. Churchill and Dr. Dunn. There was a rapid drop of the temperature within twenty-four hours. In three fatal cases the temperature did not rise after the first drop, though in the majority of cases it rose again and required three or four injections on successive days to bring it down to normal. There was cessation of pain, disappearance of the rigidity of the neck, etc. He had also found König's sign most persistent. In regard to the effect upon the blood, there was a positive increase in polymorphonuclear leukocytes after one injection. This had also been observed in other types of meningitis. The typical fluid changed to a turbid one in six cases of tuberculous meningitis and there was an increase of polymorphonuclears. He had noted this in cases of influenza meningitis. In pneumococcic meningitis there was no effect on the fluid after serum injections. The extracellular organisms found in the first specimens were intracellular in the subsequent ones. The bacteria were destroyed, losing their staining characteristics and becoming granular and ill-defined. This had been substantiated by cultures. There was no growth at all in many instances after the first injection; in some cases there was a diminished number of colonies. He had been impressed by the rapidity of the disappearance of symptoms which justified the idea of the antitoxic property in the serum. There was also a loss of staining property and viability, which suggested a bacteriolytic property. The cells outside the leukocytes disappeared after the first injection. Those within the cells stained poorly.

DR. A. JACOBI, of New York, said that, as he had no active service he had had no experience with the serum treatment of this disease and knew only what he had heard and read. The remark was made that whenever there was a subnormal temperature there was a fatality, and the question arose as to whether anything could be done in these cases. We expected a case of diphtheria with subnormal temperature to die. There were cases in which antitoxin was of no use; no matter at what stage of the disease it was given. In these cases there were complications, and the question arose as to whether the subnormal tem-

perature was due to some complication that we did not as yet understand. Could there not be a treatment beside the serum treatment which would correct the complication? We knew that in diphtheria a number of cases that did not respond to antitoxin did respond to alcohol.

Dr. JOHN LOVETT MORSE, of Boston, said that his experience with the serum had not been as great as that of some of the other speakers, but he had seen a good deal of meningitis in past years, mostly in babies. Clinical observation was so unreliable in this disease that we might be mistaken in assuming that the results of serum treatment are so good, but we could not be mistaken in what we saw in the examination of the spinal fluid. When we found that after giving an injection of serum there were no organisms outside the cells and a diminished number in the cells, and on the following day no organisms and no cultures, we could not doubt the efficiency of the serum. He thought that lumbar puncture should be done on the suspicion that the case was one of spinal meningitis. It was our plain duty to find out, and if we found a turbid fluid it was our duty to give the serum and not to wait to find the germ. Someone stated that we should not give the serum unless there were signs of increased pressure. We administered it when we knew that the pressure was diminished, but found the meningococcus in the fluid. Why should we put in the same amount we took out? If there was increased pressure there was an abnormal amount of fluid. We gave the serum to kill the organisms, not to reduce pressure. Suppose one got a dry tap, should the serum not be given? In one case in his experience, the first tap gave a thick fluid that would scarcely run through the needle, but this showed the meningococcus. The baby needed the serum. For two days following there was a dry tap and still the baby needed serum. He agreed with Dr. Churchill that a turbid fluid was an indication, for the use of serum and it should be used at least every day and sometimes oftener than once a day.

Dr. ROLAND G. FREEMAN, of New York, said that we should emphasize the fact that the serum might be of use in the very late stages in some cases. In three of Dr. Churchill's cases the serum was of value in a very late stage of the disease and was followed by prompt reaction.

Dr. W. W. WILKINSON, of Washington, said that they had treated 10 cases at the Garfield Hospital, and of these seven recovered and three died. He thought one of these cases should not have died; only 15 c.c. of serum was given. One of the fatal cases had chronic hydrocephalus when admitted to the hospital. The third case was very severe and the child was in a comatose condition when treatment was begun. His mental condition became better, but he developed intestinal paralysis and nothing could be done for him. They had had their best results with one injection of 15 c.c. or two of 30 c.c. on successive days. There were four cases that recovered with one injection

of 15 c.c. The earliest date at which they had gotten a case was on the fourth day. There was a cessation of the bad symptoms after four or five days and the disease lasted about fourteen days after the first injection. Examinations made showed that the organisms disappeared rapidly from the fluid after the first injection and those in the leukocytes diminished. They also found an increase in the phagocytes. The organisms were so badly stained that one could hardly distinguish them. One of the fatal cases was a mixed infection. Three cases had sequelæ. One lost the right eye, one was deaf and one recovered with impaired mentality.

DR. SAMUAL S. ADAMS, of Washington, called attention to the fact that clinical observations were of great importance. By the administration of the serum treatment we avoided those sequelæ which were worse than death. The observation of years showed that both in institutions and in private practice a certain percentage died and that of the percentage which was supposed to recover many were left with such sequelæ that it would have been better for them and for the community had they died. He had had a high mortality with other methods of treatment as the others had had. Of the recoveries he had a fair proportion who were deficient in mentality and had other sequelæ of the disease. His experience with the serum had been very limited. In one case of a child of seven months with pressure so great as to burst through the fontanel, one injection of the serum caused a marked improvement within twenty-four hours. In the case of a boy thirteen years of age, who had convulsions and opisthotonos and whose symptoms were most intense, recovery took place and, though the stiffness in the neck persisted for a couple of weeks, the boy was perfectly conscious and intelligent. The results of this method of treatment were encouraging enough to warrant further use of the method; it had certainly given better results than any other method that had been tried in the past three decades.

DR. CHARLES G. KERLEY, of New York, thought this the most interesting session in the history of the society. They had considered the cure of a disease which hitherto had been regarded as having no hope so far as medical measures were concerned. He hoped that the good results would continue and that we would not have to wake up to find ourselves disappointed in the hope that we now had of subduing this malady.

DR. J. H. MASON KNOX, in closing the discussion, said that the clinical value of the serum had attracted more cases to the hospital that they had had before. The statistics of Baltimore showed that there had been more cases than usual though there had been no epidemic.

DR. CHARLES HUNTER DUNN was interested in hearing Dr. Knox say that the serum caused a great deal of pain. He had had two cases in which the patients complained of severe pain in the back of the legs and knees. He found that in these cases

he had failed to warm the serum. None of the other cases had complained and he did not know whether that had anything to do with the pain or not. He did not wish to be understood as saying that all cases with subnormal temperature died. One patient who had a subnormal temperature recovered after seven weeks' illness. He meant to say that all cases that passed over the period of active fever and symptoms and then went into a state of unconsciousness with subnormal temperature belonged to the type of case that was unfavorable. He also found that so far as their cases were concerned during the past ten years there was no difference in type in the so-called epidemic years.

DR. HENRY KOPLIK did not think one should puncture except on indication. We did not wish only to reduce pressure by puncture, but also to affect the organisms. He had observed that if one introduced 30 c.c. after having withdrawn that amount of fluid the following day, the indication of the amount of fluid in the ventricle was less than the preceding day. If a child was doing well he considered it superfluous therapy to puncture again immediately. His results were fully as good as any reported.

DR. SIMON FLEXNER recognized Dr. Koplik's criticism that meningitis was a very variable disease not only in different seasons, but in different localities. It had been difficult to get statistics of cases occurring at the same time and in the same place, where nothing or only lumbar puncture had been done and of those in which the serum had been systematically used. He had the largest and best statistics from Belfast because there had been an epidemic for the year. He could not say whether they had used the puncture for diagnostic purposes only or not. The mortality for cases treated outside the fever hospitals had been 80 per cent. when it was only 25 per cent. in the hospitals. The cases outside were probably not treated so well as those in the hospitals. Cases outside may have included a greater number of fulminating cases, but the difference in the mortality was so great that something else would be required to explain it. There had been an epidemic in Akron, Ohio, the year after the one in New York. There were two sets of statistics to consider: One of twelve cases treated with the serum in which there were three deaths and nine recoveries and another in which there were nine cases treated without the serum with eight deaths and one recovery. He did not wish to put himself in the position of making out a strong case for the serum, but only to state facts much as he believed in the serum. The serum belonged to a class of bacteriological sera in which one was obliged to use the antitoxic properties of the organism. We knew three antitoxic sera—diphtheria, tetanus and dysentery. You could give an animal any amount of tetanus toxin you pleased and if you gave the animal a corresponding amount of the antitoxin the animal would be saved. The same facts were true of the dysentery serum. If the toxic and antitoxic sera were multiplied equally you got

neutralization. This was not true of the meningitis serum. The organisms were grown and subjected to unfavorable conditions and underwent autolysis and yielded this extracellular toxin with which they began immunizing horses. It took many months to accustom them to a considerable dosage. The living organism was used in order to secure a bacteriolytic property. When the serum was tested on animals it was found that it did not proceed according to the law of multiples as did the diphtheria and dysentery serum. You could protect the guinea-pig by a certain amount, but a point was reached beyond which multiples did not help you. In using a subcutaneous injection one must bear in mind that a great deal depended upon concentration. When the dilution with blood and lymph was too great, the strength of the serum was not sufficient to produce favorable results. Dr. Flexner thought that success was due to the fact that a bacteriolytic, partially antitoxic substance was brought into contact with the focus of the disease. If it was given in the circulation you could not stop the excretion. This fluid was required in a certain state of concentration and injected directly into the spinal membranes. This study involved the larger question—that is, that it was an indication of the value of local application. If some such means of treating pneumonia could be found it should be tried by all means. That is to bring a serum of this kind to the focus of the disease. It was not sufficient to introduce it into the circulation. This would not neutralize a poison that was already attached to a viscus. The disease was a local one with general symptoms and consequently we must endeavor to bring the agent directly in contact with the focus of the disease.

(To be continued.)

REVIEWS.

A MANUAL OF DISEASES OF INFANTS AND CHILDREN. By JOHN RUHRAH, M. D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Baltimore. Second Revised Edition. 12 mo volume of 423 pages, fully illustrated. Philadelphia and London: W. B. Saunders Company, 1908. Flexible leather, \$2.00 net.

In the curriculum of the modern medical school an attempt is made to give the student a knowledge of each of the several specialties. This is a difficult matter because of the extent of the field to be covered, and because only a small proportion of the students are able to read rapidly the larger text-books and still retain a clear working picture of each condition described. An attempt has been made in recent years to meet this problem by the preparation of numerous condensations of varied value which should lessen the labor of the student while aiming to furnish him with a concise abstract which might be readily grasped. The

question may naturally be asked whether that which is gained by this plan compensates for that which is lost. Will not the student feel that in the necessarily abbreviated paragraphs he has mastered all that there is to know. Will he not later, in time of need, turn to his accustomed text-book with its limitations rather than to some fuller treatise with whose pages he should already be familiar? In short is not a system which is designed to help the students of lesser ability liable to do injury to those of more serious bent, or is this disadvantage counterbalanced by the fact that while the condensed volume enables all students to gain a comprehensive view of the field in the short time allotted to each specialty, the more able individuals among them will readily enlarge their horizon by supplementary reading.

Whatever the solution of such problems suggested by all condensed text-books, Dr. Ruhrah's volume meets the purpose for which it is expressly designed far better than most others, and a criticism which keeps his purpose in mind cannot be other than favorable. The student who has mastered its pages has a good foundation upon which to build the knowledge derived from the clinical lectures and practical work of his course. He would be fitted to pass the usual examinations. The illustrations are in the main well chosen and should prove helpful in grasping many of the less common conditions. Certain new features have been introduced in this the second edition. Among the most important are the pages upon "The Medical Inspection of School Children," while the Chapter upon "Pediatric Literature and how to utilize it" followed, as it is, by a bibliography of recent pediatric monographs contains suggestions which should prove of the greatest value to ambitious students or recent graduates who might otherwise waste valuable time or be entirely discouraged in an attempt to extend their knowledge of particular subjects. Altogether this revised volume should be accorded the same favorable reception which was given its predecessor, always recognizing that in its scope it is intended for the student rather than the practitioner, although the latter may find in it much of value for hurried reference.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Diagnosis and Treatment of Hydrocephalus.—Hammerschlag (*Monat. f. Geb. u. Gyn.*, April, 1908) says that the prognosis of hydrocephalus in the unborn child is very bad for the mother, delivery requiring some sort of operation. Maternal mortality is 20 per cent., of which 13 per cent. is from rupture of the uterus and 7 per cent. from infection. The diagnosis of this condition is difficult, there being no one infallible sign of its presence. The signs given are these: conformation of the abdomen is peculiar

but is the same for hydramnion, twins, ascites and hydrocephalus; absence of ballottement depends on the size of the head, which may be hydrocephalic and yet give ballottement with a large amount of amniotic liquid, feeling like parchment through the abdominal walls noted only with very thin walls; nonengagement of the head, common to many conditions. Frequency of heart action is of no value. Feeling of widely-open sutures and fontanels is found in some nonhydrocephalic heads, as in one case described by the author, in which an attempt was made to collapse the skull by perforation of a head that proved to be normal, ossification being slow. Carrying the entire hand into the uterus is difficult and dangerous for the mother, rupture being possible. In aftercoming head the condition will not be suspected until the body is born. The most important sign is the abnormal size of the head as felt through the abdominal walls. In some cases a forceps operation can be done; in others the covering of the fontanels can be pierced and the fluid drawn off without injuring the child, in others only perforation and crushing will allow of delivery.

Epilepsy Caused by Eye-strain.—G. M. Gould (*Buff. Med. Jour.*, May, 1908) records a case of epilepsy in a child of four years. During the preceding year, the attacks of grand mal and petit mal had together ranged between 437 and 969 a month, and this although the child was stupefied with bromid. The writer discontinued these, atropinized the eyes and subsequently fitted glasses. For one and a half years the child wore spectacles and received no drugs. During the last six months he had had only two or three attacks of petit mal.

Climatic Treatment of Children.—The first object in applying diversities of climate, according to F. S. Wachenheim (*N. Y. Med. Jour.*, April 18, 1908), must be to ascertain that indifferent temperature which feels neither warm nor cool, and is therefore most restful. In the normal adult the indifferent temperature stands at about 75° F. in summer clothing and 65° F. in heavy winter garments, but is reduced about ten degrees by such moderate exercise as walking. In children the indifferent temperature ranges higher, only a few degrees toward puberty, five or more in early childhood, varying considerably according to individual robustness, rising rather rapidly to near the body temperature in earliest infancy. Young children stand severe cold badly. Temperatures above the indifferent point are not to be employed under any circumstances. Rain is useful in moderation, especially if in brief showers to lay the dust. A permanent winter snow sheet is of great value for the same reason, but the alternation of frost and thaw, rain and snow of the Eastern States, from Massachusetts to New Jersey, in ordinary winters is objectionable. The relative humidity is important in that it checks the evaporation of body moisture and consequent reduction of body temperature in proportion to its own percentage. A low relative humidity is extremely valuable in lowering the sensible tempera-

ture or, what amounts to the same, raising the indifferent temperature. At temperatures below the indifferent point, the relative humidity has no practical importance, not being physiologically perceptible. Clinically, the relative humidity at moderately high temperatures is important for such cases as call for tree transpiration, where we desire to relieve the kidneys by causing diaphoresis; here a warm and moist climate is indicated as being the best mild diaphoretic known. Such localities as the middle Atlantic coast in summer, the south Atlantic coast in winter, and the southwest California coast at all seasons are sure to be of value in chronic nephritis or albuminuria. Great altitudes cause a hypertrophy of the red blood-cells in proportion to the elevation, and, as a necessary consequence, a general stimulation to metabolism; they are, therefore, admirable as a general tonic in torpid states, but contraindicated in severe organic disease, where rest is indicated. Elevations below 1000 feet may be disregarded; those up to 3000 feet are most generally useful where a moderate toning up is desired; the higher levels are only to be resorted to where a course of physical training is distinctly called for, as in older children who have become enervated from excessive warmth or lack of exercise. The anemias of young subjects do best at the moderate elevations of the Eastern mountains, and the same is true of the victims of general malnutrition, rickets, scrofulosis, and chronic tuberculosis. Greatly debilitated children are indeed benefited most by elevations of 500 to 1500 feet.

Burns and Scalds in Infants and Children.—It is estimated that three-fourths of all burns and scalds occur in children. In their treatment, M. Seale (*Med. Rec.*, May 9, 1908) regard strict sterility of the wound and everything coming into contact with it as of prime importance. The wound should be irrigated with a warm aqueous 1:6 to 1:10 solution of hydrogen peroxid and then with warm normal saline solution or 3 per cent. boric acid solution. If the epidermis only is injured the cleansed wound may be protected with sterile gauze covered with a very thin ointment of zinc oxid and olive oil with 3 per cent. boric acid added if necessary. As a general rule, burns and scalds involving the papillary layer do best when protected by means of rubber tissue or silver foil, placed in overlapping strips one-half to one inch wide, thus allowing the escape of discharge from the wound, and its being immediately taken up the overlying layers of gauze, which latter in no part comes in contact with the wound surface. Other things being equal, the more exuberant the granulations the denser the resulting scar. Constitutional treatment is of great importance. Pain must be relieved by opium in some form, for pronounced shock, continuous hot rectal normal saline colonic irrigation is of great service.

Treatment of Eczema in Infants and Children by Thyroid Substance.—Like several other writers who have recently made similar reports concerning limited numbers of cases, J. Eason

(*Scot. Med. and Surg. Jour.*, May, 1908) has obtained most satisfactory results in infantile eczema by the administration of thyroid substance only in five cases. In five others this medication was supplemented by local treatment with similar results.

Vulvovaginitis in Children.—A. J. Ronginsky (*Pediatrics*, May, 1908) does not regard gonorrhœal vaginitis as being as prevalent in private practice as is generally supposed. He says that in hospital practice the most common variety of vulvovaginitis that is met is of specific origin due to direct transmission of the infection from one child to the other. Vulvovaginitis, although of specific origin, is not contagious if two or three smears of the discharge fail to demonstrate the presence of the gonococci. With proper hygienic care 50 per cent. of all cases of vulvovaginitis can be prevented.

Scoliosis and Nutrition in Adolescents.—Dr. Hutinel (*Ann. de Méd. et Chir. Infant.*, March 15, 1908) says that scoliosis is not a local malady, but is the result of trouble of nutrition of which traces are to be found in various organs as well as in the spine. It appears most often between the ages of eight and thirteen years, and most frequently in girls. In boys, though less frequent, it is more serious. It appears often to be hereditary. The author regards it as a manifestation of rickets occurring in later life. In these girls the pelvis is large enough and the legs are well developed, but the upper part of the body is narrow and bent. The lower part is that of a woman, the upper that of a child. The arms are thin, the muscles are thin and easily fatigued. There are circulatory troubles: the face reddens and pales easily, hands and feet are cold and blue, and when grasped, damp and disagreeable to the touch. Acne is frequent as are dyspnea and palpitation. Digestion is poor, and colitis and constipation are present. Cyclic albuminuria is present without true kidney lesion, no casts being found. Uric acid is in excess of urea and phosphates are in excess. The liver acts poorly. The nervous system is especially affected. Headache and incapacity for mental or physical work are marked conditions. Hysteria and neurasthenia with anesthesia or hyperesthesia are often seen. Visceral ptoses are found, with inability to stand and walk without fatigue and pain. Heredity, malassimilation, and insufficient oxygenation all become causes of the condition. Treatment demands rest, economy of the forces, plenty of sleep, and no fatiguing exercise, friction and massage, hydrotherapy and fresh air. Nourishing food and glycerophosphate of lime and arsenic are valuable remedies.

Constipation in Nursing Infants.—E. Gaujoux (*Ann. de Méd. et Chir. Infant.*, April, 1908) classifies constipation in infants thus: constipation due to obstacles to evacuation; constipation as a result of modifications of the contour of the intestinal canal; and constipation due to lack of power in the muscular fibers of the intestine. Congenital stenosis of the intestine in infants is very rare. Twisting and spasms are more frequent. Con-

tracture of the pyloric ring may be present. Constipation by modification of the ingesta includes the results of diminished ingesta, increased resorption of liquids, diminution of the intestinal secretions, and failure in the quality of the ingesta. Failure of muscular power is generally reflex; there may be anesthesia of the mucous membrane of the colon, paralysis of the nerve-centers, or atony of the muscle-fibers.

Anorexia Nervosa in an Infant.—The case recorded by J. P. C. Griffith (*Arch. Ped.*, May, 1908) is that of a boy who had ileocolitis at nine months. After recovery from this he seemed to have an aversion for anything given from a spoon or glass, but took the breast readily and would eat bread from the hand. Efforts to wean failed and nursing and feeding with bread were continued until twenty months old, at which time there were loss of weight, crying and diarrhea. After four weeks of failure to make him eat gavage was employed, giving, at first, peptonized milk with zwieback and bread three times a day. It was necessary to continue gavage three times a day for about six months, the food consisting of a glass of peptonized milk and a raw egg at breakfast and again at supper, with beef juice and a glass of peptonized milk for dinner. Finally, the child began to struggle violently against the use of the tube, and to drag it out after it had been introduced. Renewed efforts at compulsory feeding were consequently made, bribes and threats being employed, and the anorexia was gradually overcome at the age of about two and a quarter years. He still, at the age of six, had to be almost forced to eat and if left to himself would take little. In this case there was no evidence of organic affection of the gastroenteric tract or other cause to which the anorexia could be attributed, except that perhaps the giving of medicine at the age of nine months awakened a fear of anything which was put into a spoon.

Removal of the Child from the Breast.—C. B. Reed (*Surg. Gyn. and Obst.*, May, 1908) has investigated the published statements concerning this subject. He finds it probable that alcohol, opium, chloroform, ether, thyroid extract, and lead should be used with extreme care in a nursing woman until their status is determined; that zinc apparently has no effect, while all the others investigated, namely, atropine, arsenic, antipyrine, acetic acid, bismuth, bromide of potassium, balsam of copaiba, castor oil, copper, chloral, iodine and its compounds, mercury, phenacetine, quinine, salicylic acid, and senna, pass over in small quantities, but very rarely to a degree injurious to a sensitive babe. Hence, it is practically never necessary to remove the child from the breast on account of drugs administered to the mother. A logical inference may also be drawn that, owing to the total absence of transmission, or owing to the impossibility of satisfactorily measuring the amount transmitted, it is never desirable to attempt to medicate the child by means of drugs administered to the mother. Nephritis,

serious and obstinate erosion and fissure of nipple, Paget's disease, scirrhus, sarcoma or abscess of the breast, together with local or systemic tuberculosis, syphilis, erysipelas, acute articular rheumatism, acute pulmonary or pleuritic affections, and all infectious and contagious diseases, osteomalacia, and all puerperal infections that are not mild and transitory in character, as a rule, demand the absolute separation of mother and child.

Treatment of Inguinal Hernia in the New-born.—Broca (*Bull. de la Soc. de l'Internat des Hôp. de Paris*, April, 1908) considers that the degree of malformation in the new-born infant is of importance. The hernia results from the imperfect obliteration of the vagino-peritoneal sac, which occurs at term. When an infant is born prematurely, even fifteen hours before term, there is an imperfect obliteration of the sac and a predisposition to the occurrence of inguinal hernia. Another factor of much importance is the occurrence of rickets. The large, flaccid, weak-muscled abdomen of the rachitic child predisposes him to hernia. Heredity, especially in the father, is an important factor. It is rare to find hernia at the moment of birth, and thus this is not strictly a congenital hernia. It occurs as a result of cough, such as some in bronchopneumonia and thus this disease is to be avoided in premature infants. Another cause is straining and crying. Attacks of intestinal trouble, diarrhea and constipation with straining at stool are predisposing causes, and conversely hernia is a cause of them. That a vicious circle is established. These herniæ are frequently of very large size, and contains parts of the large intestine, especially the cecum and sigmoid flexure. Cure results from the closure of the vagino-peritoneal canal, and this may often be produced in very young infants by the use of a double bandage worn day and night to retain the contents of the hernia. In older children this may not be sufficient and operation has to be preferred, since in them it is not dangerous, while with young infants it is. In these older children the constant wearing of a bandage is unbearable and prevents the child from doing many things that a child wishes to do. In these cases the hernia grows large and gives more and more pain and disturbance. The prognosis of hernia in the infant is very variable. It varies with the age, development and nourishment of the child and with several other factors. Strangulation occurs easily.

When obstruction occurs a warm bath or a mustard paste may cause it to be released spontaneously; in others moderate taxis may be used. Violent and long continued efforts at reduction should not be made, since they may cause gangrene. Young children who are nursing should never be separated from mother or nurse to do an operation, since this may cause death. Hence they should be operated on at home when necessary, rather than taken to a hospital that will not admit the mother also.

Obstacles Presented by the Intestinal Walls and the Liver

to the Passage of Poisons into the System.—E. Terrien (*Ann. de Méd. et Chir. Infant.*, April, 1908) believes it logical to think that the liver is the seat of alterations of an anatomical nature in gastrointestinal troubles, and that to these anatomical lesions there correspond functional troubles of the hepatic cells. To measure the power of the cells he has made experiments in animals. He concludes that the antitoxic power of the liver in the young animal is equal or superior to that of the adult; that its power is lessened in gastrointestinal diseases since glycosuria of alimentary nature easily appears in these cases; that nevertheless the sum of the resistances opposed by the liver and intestines to the passage of toxins is great.

Kidney Lesions in the Infant.—Speaking of the pathological aspects of this subject, R. L. Thompson (*Arch. Ped.*, May, 1908) says that marked disturbances of circulation, and slight or moderate degenerative processes, are exceedingly common in the infant kidney. These processes, while they give rise to albumin and casts in many instances, are of a type that is easily repaired and probably do not influence the permanent integrity of the kidney. Severe kidney lesions, such as permanently injure the kidney parenchyma, or lead to death, are rarely found in routine autopsies in infants.

J. M. Brady (*Arch. Ped.*, May, 1908) discussing the subject from a clinical stand-point, says that a diagnosis of nephritis cannot be based on the presence of casts and albumin in the urine, as slight degenerative changes may cause them to be present. On the other hand, pronounced kidney inflammation may be present with very few clinical symptoms. Edema and anasarca, when present in the infant, are usually indicative of conditions other than nephritis. Most cases of nephritis in the infant are mild, and are secondary to pathological processes elsewhere. Owing to the milk diet and the marked reparative powers of the infant kidney, these inflammations tend to complete recovery when the primary disease is recovered from. The diagnosis of nephritis of slight extent, which is the frequent accompaniment of various conditions, cannot be made *intra vitam* with certainty, since it cannot be distinguished clinically from the simple degenerative changes, without inflammation, which are nearly always present in infants suffering from either infectious or noninfectious diseases.

Clinical and Experimental Study of the Action of the Antibactericidal Serum of Bandi as a Local Application in Diphtheria.—M. Picherle and Uno Calcaterra (*Riv. di Clin. Ped.*, April, 1908), after treating with local applications of the serum of Bandi and its powdered residue sixteen cases that had been proved by culture to be true diphtheria, give their conclusions. They treated parallel cases with plain antiseptics and other cases were left untreated. They found that the clinical course and macroscopic evolution of the pseudomembrane are not modified by the serum; the reproduction of the membrane and

its spread to other parts of the mucous membrane are not limited by its action, and when sprayed into the larynx or injected intratracheally it has not any effect in preventing the spread of membrane to this organ. Paralysis is not prevented. Modifications of the morphology of the germs is not found to occur. The bacilli do not disappear any sooner than when simple antiseptic solutions are used for applications. The applications cannot be made sufficiently constantly to have any marked therapeutic effect. The curative effect of the treatment is nil. The use of antitoxin is much to be preferred to that of Bandi serum.

Laryngeal Diphtheria.—H. G. Langworthy (*Iowa Med. Jour.*, May 15, 1908) calls attention to the fact that in over a fifth of the cases of laryngeal diphtheria no membrane will be observed in the throat and cultures may be negative. Dyspnea in very young children characterized by stiffening of the sternocleido-mastoid muscles during inspiration with supraclavicular and substernal retraction should be treated as diphtheria. Every case of so-called croup should be considered as diphtheritis laryngitis unless it can be proven otherwise.

Acute Anterior Poliomyelitis.—L. E. Holt and F. H. Bartlett (*Amer. Jour. Med. Sci.*, May, 1908) have collated the reports of thirty-five epidemics of acute poliomyelitis occurring prior to that of 1907. Concerning the question of the occurrence of an increased number of sporadic cases in seasons succeeding epidemics they say that this was found so stated in but one instance. Location and surroundings seem to have little influence upon the occurrence of epidemics. It is not possible from recorded facts, to draw any deduction as to the association of poliomyelitis with any other disease. As to the communicability of the disease, the writers have collected forty instances, comprising 96 cases, in which more than one case occurred in a family or household. Omitting a single case which occurred after an interval of six weeks, which belongs apparently to a different category, and a doubtful case, which occurred after an interval of six to thirteen days, there were thirty-seven instances in which the second case followed the first within ten days, and thirty-three instances in which the interval was less than one week, while in thirteen instances the attacks occurred at about the same time or within twenty-four hours. The writers conclude that the disease is communicable, although only to a very slight degree, one of the most striking facts being the development of the second cases within ten days after possible exposure.

Analyzing 500 cases of anterior poliomyelitis. Joseph Collins and T. H. Romeiser (*Jour. Amer. Med. Assn.*, May 30, 1908) say that the cases observed in the epidemic of 1907 show conclusively that the infection which causes the disease finds the entire central nervous system and its coverings susceptible. The gray of the anterior horns is merely the most susceptible

or the most perishable under its influence. The meninges, the gray matter of the cortex, of the bulb and of the brain stem, and even the white matter, may all be affected. The intensity of affection of these parts rarely, however, goes beyond the stage of irritation. Another thing that may be concluded is that the prognosis in anterior poliomyelitis is, like that in other infectious disease, such as pneumonia, typhoid and meningitis, a variable quantity. In some epidemics many cases recover; in others very few. Formerly it was widely taught that poliomyelitis never ended in complete recovery. A considerable number of the cases analyzed by the writers have made a fair recovery.

Recognition of the Spirochæta Pallida in Congenital Syphilis.—

—C. Greuven (*Zent. für Gyn.*, May 2, 1908) says that the sero-diagnosis of latent syphilis is of value, but not so important as the finding of the spirochætes in the organs. In many cases the symptoms clearly point to the diagnosis of syphilis; in others the diagnosis is difficult and a rapid examination for spirochætes is not feasible. The detection of the spirochætes is possible in preparations of tissue and puncture fluids from glands or internal organs. More practical is the examination of stained smears and sections. In skin and mucous membrane efflorescences the exudate of blood-serum mixed with little particles of tissues is placed on a cover-glass. The Giemsa stain is one of the best methods, staining going on for one to two hours in a mixture of ten drops of distilled water with ten drops of Giemsa solution, and a few drops of one to one thousand calcium carbonate solution. Giemsa's quick staining method also gives excellent results. The spirochæta pallida appears as bluish-red to violet colored spirals. For sections the silver staining method is the best. The sections are fixed in formalin for twenty-four hours, in alcohol for twenty-four more, washed for half an hour, and placed in 90 c.c. of a mixture of $1\frac{1}{2}$ per cent. silver nitrate solution and 10 c.c. of pyridin. In this they remain for three or four hours. They are then reduced in a mixture of 4 per cent. pyrogallol solution and acetone 10 per cent., with 15 per cent. pyridin for twelve to twenty-four hours. The spirochætes appear deep black on a bright-yellow ground. In congenital syphilis the best results are obtained by sections of all the internal organs. Spirochætes are found in skin sections, pemphigus bullæ, liver, spleen, kidneys, suprarenal capsules, placenta, brain, spinal cord, nerves, heart, vessels, periosteum, stomach, intestine, pancreas, ovaries, testicles, cornea, etc.

Aural Manifestations of Inherited Syphilis.—Writing of the aural manifestations of inherited syphilis. M. Yearsley (*Brit. Journ. Child. Dis.*, May, 1908) says that catarrhal and suppurative middle-ear inflammations may occur in inherited syphilis, or the labyrinth may be attacked in two ways. In one group of the latter cases there is no vertigo. In these the stigmata of inherited syphilis are usually well marked. If they are absent, the

diagnosis must rest upon insidious internal ear deafness coming on between the ages of eight and twenty-five, all other causes being excluded. The pathological condition is chiefly a chronic osteitis, gradually leading to occlusion of the internal auditory meatus and bony labyrinth. In the second group of cases vertigo is a prominent symptom. The symptoms are best accounted for by an increase of tension due to exudation. In those forms that are acute in onset the deafness is due to an immediate destruction of the labyrinthine nerve-endings by pressure alone; in such cases the prognosis is worse than in those which run a sub-acute or chronic course, in which the symptoms are due rather to a constantly recurring increase of tension, and to changes in the exudation itself acting on the labyrinthine nerve-endings. In the author's thirty-two cases, specific treatment, even when commenced as soon as the aural trouble became manifest was without effect in fifteen. In labyrinthine deafness due to acquired syphilis, pilocarpin is a very valuable agent, provided it is employed early in the condition. It is equally useful, with the same proviso, in inherited syphilis of the labyrinth. When treatment by pilocarpin or by specific remedies does not have any effect, Politzer recommends the use of iodid or sulphur baths.

Erysipelas in the New-born.—A. Herrgott (*Ann. de Gyn. et d'Obst.*, May, 1908) says that erysipelas in new-born infants is extremely grave and merits consideration. It generally shows itself by the presence of peritonitis, the tissues not showing the usual lesions. The author gives two illustrative cases, both of which were rapidly fatal. The grave feature in these cases is the absence of phagocytosis in the new-born. The infection by the streptococcus is not antagonized by the leukocytes and hence it goes on to infectious peritonitis. In children over three months old phagocytosis occurs and the results are quite different. The lesions that exist in the skin differ materially from those of the adult. It is the subcutaneous tissues that are especially involved, and here most of the bacteria are found. The lymphatic vessels of the subcutaneous tissues are filled with them and they are very abundant in the loose cellular tissue which forms the outside coat of the arteries. Histological lesions are almost absent, the skin being only slightly edematous. This absence of reaction renders the disease much more grave. The lymphatic ganglia oppose no resistance to the germs. When an abscess forms the prognosis is much better because this shows that reaction is taking place. The progress of erysipelas in infants is very insidious. The germ enters by the solution of continuity at the umbilicus. Redness is not very intense, and the skin and subcutaneous tissues are indurated. A rapid evolution goes on to peritonitis and death. Treatment has very little effect.

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ORIGINAL COMMUNICATIONS.

THE MANAGEMENT OF THE STAGES OF LABOR TO
PREVENT MATERNAL DYSTOCIA.*

BY

RICHARD C. NORRIS, M. D.,

Philadelphia.

THE topics assigned me by your secretary, the prevention of inertia, hemorrhage and lacerations are in some respects antithetical. For the first, the labor must be hastened; to avoid the second it must be neither too rapid nor too slow; and for the third the termination of labor must be retarded. Individuals differ so in strength, endurance and quality of tissue that the actual duration of the first and second stages of labor has and should have wide variations. An unduly prolonged labor from abdominal or uterine inertia may often be expected in patients who lack muscular tone, who are anemic and in whom there has been over-distension from twins, hydramnion, or tumors. Diastasis of the recti muscles with a pendulous uterus seriously interferes with the proper direction of the forces of labor and predisposes to exhaustion and inertia. A history of hemorrhage after previous labors, the presence of a fibroid or of adhesions following any abdominal operation, especially hysterorrhaphy, frequently warn us of inertia and hemorrhage. Of the various drugs to improve the blood's quality and thus favor its coagulability and fibrin formation I have had more faith in the organic preparations of iron than in the calcium salts or in gelatin. The prophylaxis of hemorrhage may, of course, begin during pregnancy, but it is of trifling value compared to the proper and

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skillful management of the three stages of labor. This, then—the skillful conduct of the stages of labor—is the kernel of the topics assigned me, which do not include mechanical obstacles to labor, such as tumors and pelvic deformity, and which, I understand, are to be discussed in a practical way and from the view-point of the practitioner whose environment compels him to make obstetrics the specialty of his general practice. Although the duration of the first and second stages of labor will safely have wide variations in different types of women, it has been my experience that, when the amniotic sac is unruptured, delay beyond twelve hours in the first stage of labor associated with nagging, inefficient pains, is best treated by narcotics that allay irritability and produce sleep. Ten or fifteen grains of chloral, repeated and reinforced if necessary by a sixth of morphia hypodermatically, will usually produce a sleep from which the patient awakens refreshed and with more efficient uterine contractions. I have combined morphia with scopolamine and with hyoscin, but could not convince myself that such combinations were more efficient than a proportionate amount of morphia. I have little faith in the efficacy of quinin for uterine inertia, have thought the general stimulant effect of the fluid extract of kola-nut was sometimes of service, and I never use ergot during the first or second stages of labor. In multiparæ with two-thirds dilatation the membranes may be ruptured. A slow and tedious first stage is often thus speedily ended. In primiparæ, early rupture either increases the delay or predisposes to lacerations of the cervix. An edematous cervix nipped between the head and symphysis should not be forcibly stripped back over the head. A sterilized glycerin tampon held in contact with the lip of the cervix will often cause this obstruction to disappear. Following the sleep produced by the narcotic, further delay in dilatation of the cervix and lower uterine segment is best treated by artificial dilatation. It is assumed that over-distention of the bladder has not been permitted and that abnormal mechanism has been corrected by appropriate measures. The latter is especially true of occiput posterior positions, arrested at the brim by incomplete flexion of the head. The various anomalies of the cervix—spasm, rigidity, hypertrophy or cicatricial contraction—may be the underlying factor in a prolonged first stage. Having recognized one of these, the case must not be left to nature. If bag dilatation or manual efforts after effacement of the cervix either fail or are manifestly inappropriate, Dührssen's

incisions are indicated. Care should be taken to make these incisions free enough to avoid uncontrollable lacerations when the presenting part passes through the cervix. When the hypertrophy or contraction is extreme it is safer to separate the bladder to its peritoneal fold and freely incise the anterior uterine wall as in vaginal hysterotomy. After weary hours of waiting for effacement and dilatation of the cervix, the patient clamoring for relief, the temptation to the average practitioner is great to apply forceps and thus end both doctor's and patient's suffering. It is my experience that next to a disregard of aseptic technic, the early application of forceps before complete dilatation is the general practitioner's greatest obstetric sin of commission. His sin of omission is his failure to use skillfully a dilating bag. The discussions and practical application of the methods for opening the birth canal, *secundum artem*, are the most important advances in modern obstetrics, and not the least of these advances are the improved dilating bags to assist a delayed labor and prevent in great measure the lacerations that formerly so frequently resulted from instrumental aid to delivery. "*Meddlesome midwifery*," was an apt term for the pre-aseptic days; "*Helpful midwifery*," should now be substituted, but only by those who can invade the birth-canal with a technic equal to that of the abdominal surgeon.

To stimulate uterine contractions and hasten dilatation, I ordinarily use the Voorhees bag. When a forceps operation is likely to follow, the Pomeroy bag is chosen for primiparæ. Its efficient dilatation of the lower birth-canal surpasses other means for that purpose; its only drawback being the necessity for an anesthetic to relieve the pain caused by its introduction in primiparous women.

When delay occurs in the second stage of labor, the treatment requires less obstetric judgment, for it may be stated, as a rule, with few exceptions, that in primiparæ four, in multiparæ two hours should be the maximum limit of the second stage of labor. Having corrected any abnormality in mechanism and the bladder being empty, when change in posture from the side to the back, the obstetric puller, abdominal frictions, a hypodermatic injection of strychnia and obstetric analgesia secured by the intermittent administration of ether to relieve pain that may be inhibiting uterine energy, have failed to advance materially the head during an hour of recurring pains, it is my practice to apply the forceps and proceed to a slow and deliberate delivery. The patient

should be as lightly anesthetized as the number of assistants and the control of the patient will permit. For many years I have avoided deep anesthesia at the approach of the third stage of labor, preferring always to conduct the placental delivery with the patient fully returned to consciousness.

The *prevention of hemorrhage* is, broadly speaking, the proper management of the third or placental stage of labor. When uterine inertia has characterized the labor or when there is a history of bleeding, a hypodermatic injection of an aseptic preparation of ergot should be administered just prior to the delivery of the infant. Immediately thereafter the sentinel hand is placed on the fundus, but no attempt is made to deliver the placenta for fifteen to thirty minutes, so long as there is no tendency to relaxation and hemorrhage. Nature's mechanism of controlling hemorrhage will be interfered with if massage or the Credé expulsion is too early applied. The uterus is resting, retracted if not contracted, and clots are forming in the sinuses at those areas of the placenta that have been detached. Manipulation now predisposes to bleeding by dislodging those clots and the immediate necessity arising for the Credé expression its very object is defeated, because portions of the placenta not yet separated are likely to be prematurely separated and cause free bleeding. If not separated, these same portions will be torn across and left in utero to cause hemorrhage later or become infected. We should always remember that Credé devised his method, not to separate, but to expel a separated placenta. The diagnosis of placental separation is not difficult. The retracted uterus steadily rises during the process, and where the placenta has been completely separated and occupies the dilated lower uterine segment, the fundus is six inches above the symphysis, the uterus is firm, its upper segment has assumed its natural pear shape and the external length of the cord from the vulvar opening has increased from two to four inches. The opposite obtains when there is concealed bleeding from relaxation of the uterus and partial separation of the placenta. The uterus, soft and globular, steadily rises to a higher and higher level and the external portion of the cord is diminished in length as it is drawn inward and upward by a receding fundus to which the partially adherent placenta is attached. Having thus diagnosed complete separation or when partial separation is accompanied by sharp hemorrhage, then is the time for rapid Credé expression, followed by light massage of the fundus to

maintain contraction and retraction. The hooked finger may be required to dislodge the separated placenta from the lower uterine segment. Slow, steady traction is made, without twisting, to extract the membranes, and stringy filaments that break loose, being difficult to handle with the gloved fingers, are best caught in a hemostatic forceps and slowly extracted. If hemorrhage occurs and persists after the too early or unsuccessful resort to the Credé expression, aseptic ergot is injected into the thigh, the uterus is at once invaded by the gloved hand to remove clots and placental masses and to separate completely a partially adherent placenta. While a hot sterile douche and appliances for the intrauterine pack are forthcoming, the vaginal hand should grasp the cervix, occlude it and push it upward to forcibly make traction on its blood-vessels and the abdominal hand forces the fundus downward and forward over the symphysis to angulate the canal and further stretch and occlude the vessels supplying the uterus with blood. At the same time the ulnar surface of the abdominal hand may compress the aorta and vena cava through the abdominal wall. Whether the bleeding results from back pressure in the veins or comes from the arterial circulation makes no practical difference. Both trunks will be compressed by this maneuver. If the hot intrauterine douche fails to at once stop the bleeding and cause uterine contraction, the uterus should at once be firmly tamponaded with a large quantity of sterilized gauze, the tampon reaching from fundus to vulva.

The prevention of bleeding from lacerations of the cervix or vagina requires little comment. Preliminary dilatation is the all important prophylaxis. Hemorrhage due to lacerations will be readily recognized by its early occurrence, within at most fifteen minutes of the birth of the infant, and by its appearance when the uterus is empty, contracted, and retracted. The cervix, the anterior vaginal wall, and the vestibule in the region of the urinary meatus and clitoris should at once be inspected and the bleeding points clamped until sutures can be applied.

Inversion of the Uterus.—This rare accident is practically always preventable. Indentation of the uterine wall by too vigorous manipulation or violent traction on the cord when the uterus is relaxed, and especially if these two factors are coincidentally operative are the important causes of this accident. When paralysis of some portion of the wall exists, a condition not to be foretold, these manipulations are especially dangerous. When partial inversion has been recognized, completion of the

inversion can be prevented by desisting from all manipulation of the fundus and the prompt application of an intrauterine pack.

Prevention of Lacerations of the Birth-canal.—The cardinal principle underlying every means at our command to prevent lacerations of the birth-canal may be expressed in one word—*dilatation*. Precipitate labor is an extreme type of cases that are delivered without preliminary dilatation. It is impossible to prevent these sudden, almost immediate deliveries. They occur only when the passage offers no resistance and fortunately little harm results—if some one is at hand to rescue the infant from the dangers or injuries it may receive from its rapid birth. For the so-called rapid labors characterized by excessive and rapid action of the uterine and abdominal muscles, surgical anesthesia and manual resistance to the progress of the head until safe dilatation has occurred are the usual means of preventing extensive lacerations.

Rupture of the Uterus.—The prevention of uterine rupture that occurs during pregnancy from anomalies in the shape or musculature of that organ, so far as my knowledge goes, is impossible. It is quite different with rupture during labor, for here correct diagnosis of obstacles that prevent the entrance into the pelvis of one or the other pole of the fetal ovoid and early skilled operative delivery can prevent this dangerous accident. The neglected cases of obstruction bring us our spontaneous ruptures; the unskilled operator, especially when he attempts a foolhardy version, is the cause of the violent ruptures. I take it for granted that the mechanism of the "contraction ring," with its adjacent upper contracting and lower dilating uterine segment, is common knowledge. Version attempted when this ring is ocularly and palpably at or just below the umbilicus is attended with such great danger of rupture that no one should attempt it without great caution and with a surgical environment that permits a safe abdominal section. A cautious examination under ether often shows plainly that even the introduction of the hand is an unwarranted violence. The cases of violent rupture of the uterus that I have seen have all been due to contraindicated version, with one exception, and that was due to the forcible introduction of the hand to deliver a long-delayed breech presentation.

If decapitation and craniotomy are ever justifiable on a living child it is in just these cases, since the life of the infant has, by neglect, been placed in greatest jeopardy, and unless some one

is at hand skilled in Cesarean section, it is better obstetrics to sacrifice the child than deliver by version a moribund infant from a ruptured uterus.

Lacerations of the Cervix are best prevented by securing naturally or through artificial aid complete dilatation. In primiparæ early breaking of the bag of waters is vicious practice, and when there has been an early spontaneous rupture, the rubber bag, gradually distended with water at fifteen minutes' to half-hour intervals, accomplishes safe dilatation. The partially dilated cervix should never be forcibly pushed back over the head. Before forceps delivery or extraction of the after-coming head the cervix *must be completely and slowly dilated*, with the bag, manually or with most cautious use of metallic dilators, if we hope to avoid extensive lacerations that often involve the bases of the broad ligaments and upper third of the vagina. The application of the forceps before complete dilatation and their dynamic use to complete dilatation is only permissible to the operator of wide experience who knows the time required and the dangers incident to this method. Preliminary dilatation of the pelvic floor and vaginal outlet is also the best method to prevent extensive vaginal lacerations. Manual efforts cannot be compared to the efficiency of Pomeroy's bag. The tendency of its vaginal portion to be spontaneously extruded from the vagina and to drag downward the cervix, can only be prevented by holding it within the vagina during the distension of its vaginal compartment.

As the head is traversing the vaginal canal the mechanism of this stage of labor must be supervised. Rapid extension of the head should be prevented. The handles of the forceps in operative cases must not be elevated too far nor too quickly. The long diameter that offers in face presentation demands cautious flexion even after the chin has passed well beyond the sub-pubic arch. Forceps rotation of occiput posterior positions is popular in New York, but even with McLane's solid-bladed instrument is adds a distinct danger of vaginal injuries. The delivery of the persistently posterior occiput (occiput in the sacral hollow) always is best accomplished with forceps that firmly grasp the head and do not pivot at their tips, but compel the head to be overflexed when lifting the occiput over the perineum to the danger-point of laceration, and compel the head to be at once extended as the handles are depressed to sweep the face under the pubic arch until the chin escapes,

when the distension of the vaginal outlet is at once relieved. For this maneuver I have found no instrument so efficient as the old Hodge forceps. I have never convinced myself that episiotomy can prevent pelvic floor injuries and consequently never employ it except to enlarge the vulvar outlet when a sphincter laceration seems imminent. Suchard's vaginal incision, such as we use in primiparæ preliminary to vaginal Cesarean section is a more rational preventive treatment of irregular and extensive pelvic-floor lacerations. The difficulty of determining its necessity renders it of doubtful practical value in an ordinary primiparous labor.

In conclusion, let me say that the germ of truth I bring you—not new, because truth is always old—is that if you must and will practice obstetrics, the parturient patient rightly demands your undivided attention. For the complications I have discussed, our latest, perhaps our best obstetric offering, is that means are now at hand, to be used by any surgically-clean man, to safely and wisely open the lower-birth canal in the interests of both the mother and the child.

TWENTIETH AND HAMILTON STREETS.

THE EVOLUTION OF MODERN MATERNITY TECHNIC.*

ILLUSTRATED BY RECORDS OF THE NEW ENGLAND HOSPITAL
FOR WOMEN AND CHILDREN, BOSTON, FROM 1862 TO 1907.

BY

EMMA L. CALL, M.D.,

Senior Attending Physician of the New England Hospital Maternity.

THE Maternity Department of the New England Hospital was opened July 1, 1862.

This history of its work for the forty-five years of its existence, may be considered, in some measure, that of maternity-hospital work in Boston, since it is by ten years the senior of any institution of the kind in the city.

The first report, issued November 1, 1863, contains a record of forty-five births. This number increased quite rapidly, the report of 1868 showing 141 births.

By the terms of its incorporation, this hospital has always been attended by women physicians.

In its early years, when a thorough medical education for

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women was not attainable in America, it was fortunate in having for attending physicians, women who had supplemented their education here, by exceptional opportunities in lying-in hospitals of Berlin and Paris.

My personal experience in this hospital dates from 1868, when, in accordance with the custom of medical students at that time, I became the pupil of the resident physician, Dr. Lucy Sewall, studying midwifery under her direction, and practicing in the wards.

At that time there was nothing which could be called technic in obstetrical work.

Puerperal or childbed fever were the constant dread of all the physicians of maternity hospitals. At times all the cases would do well, and then without discoverable cause, fever would begin and spread among the patients with appalling rapidity and fatal results.

It was known that the disease was contagious, but the means by which the contagion was spread were not rightly understood. The researches of Semmelweiss and others had established the fact that there was danger to the lying-in woman from contact with persons who had attended postmortems or dissecting-rooms. It was also well known that exposure to erysipelas, scarlatina or diphtheria was very serious for them.

The senior attending physician, Dr. Zakrzewska, in a report to the directors in 1868, summed up the prevailing knowledge on the subject as follows:

“It is thought that carelessness and want of thorough cleanliness is at the bottom of epidemics of puerperal fever. With the greatest amount of care, and the most perfect hygienic measures, childbed fever will break out from time to time, produced by an accumulation of lying-in women. The only possible remedy is to lessen the size of these hospitals, increasing their numbers, and placing them in different parts of the city, so that at times whole wards can be left empty for purification and thorough cleansing.”

In the same report she warns benevolent ladies not to encourage poor married women to come to the hospital for confinement, saying that except in cases of absolute destitution, the humblest home is safer than the best hospital.

The difference between what was meant by thorough cleanliness in a lying-in hospital then and that of the present day is indeed a wide one. Fresh air, clean beds, and clean floors

were most carefully looked after, but cleanliness of the patient and her attendants in the surgical sense, was entirely uncomprehended.

We always washed our hands after an examination of a woman in labor, for our own protection, and annointed our fingers with oil (usually kept in an open dish standing about the room) for the same reason. No directions were given as to the condition of the hands before an examination. No limit was put to the number of digital examinations, and as the method of abdominal palpation was very little developed, almost all our knowledge was necessarily obtained by internal means.

All digital examinations were made under the bed-clothes. It was considered most indelicate to uncover a woman's genitals except at the end of the labor, when supporting the perineum. A student was held to be very awkward, who could not pass a catheter by touch, without seeing the urethra.

After delivery, the genitals were washed to remove the blood, and ordinary napkins (which had probably been handily bestowed under the pillow during the labor) were used for the lochia.

The perineum was only sutured if torn deeply. No attempt was made to discover vaginal tears, and perhaps it was quite as well that it was not done, since suturing the parts with unclean fingers would have been more likely to injure than to help them. Obstetrical operations, even low forceps, were considered very serious and only undertaken in extreme cases.

Instruments were always carefully scrubbed after using, but no particular care was taken before use. Boiling was never heard of, and as most of the instruments of that day had wooden or rubber handles cemented to the steel parts, such treatment would undoubtedly have proved disastrous.

In inverse proportion to the freedom with which digital examinations were made during labor was the fear of them after delivery. Nothing short of extreme necessity was held to justify any interference with the pelvic organs during the puerperium. I remember that vaginal douches of calcium chloride solution or permanganate of potash were occasionally given when the lochia was very foul.

Intrauterine douches or a speculum examination were practically never attempted. When we consider under what conditions such treatment would have been given, it is probable that the remedy would have proved more dangerous than the disease.

Such in brief, was the manner of conducting obstetrical cases

in the hospital during the first ten years of its existence. In the summer of 1872 the hospital was removed from the crowded part of the city to a fine location on high ground in the suburbs. The maternity cottage was planned with great care, having small wards and abundant air and sunshine. It consisted of two floors and it was expected that only one floor would be used at a time, leaving the other empty for thorough airing.

At the time the new location was considered quite out in the country, and being only accessible from the city by slow and infrequent horse cars, there was naturally for several years a marked decrease in the number of patients. The class of patients was, however, a much better one, and we have never had any considerable number of the most undesirable cases, which inevitably gravitate to an institution located in the midst of a dense population.

To the new hospital came as resident physician, Dr. Susan Dimock, a graduate of the University of Zurich. Her graduation thesis on "Puerperal Fever" was an able exposition of the latest knowledge on the subject. She brought with her the first clinical thermometers ever used in the hospital, and from that time daily temperature charts were kept.

The use of the thermometer and keeping of the charts, may be considered one of the most important steps toward solving the problem of puerperal infection, since before that there had been no accurate means of estimating the amount of constitutional disturbance in such cases.

These thermometers were nearly a foot in length, and were not self-registering, so that they could only be read *in situ*, a feat not easy to accomplish in a poor light. They were used chiefly in the axilla. The students were for a long time obliged to rule their own temperature charts, since none could be bought in Boston.

About this time, carbolic acid began to be suggested as a disinfectant in midwifery cases, but as the first record I find of its use in a vaginal douche was four drops to the pint of water, it could hardly have proved very efficacious.

In order to trace the evolution of the present-day maternity technic from its beginning, I have divided the time from 1872 to 1907 into five-year periods and endeavored to follow the changes of methods by studying the histories of one hundred cases out of each fifth year. It must be understood, however, that in speaking of the methods in use in a certain year, such

methods did not necessarily originate in that year, but only within the five-year period.

The time between 1872 and 1892 may be considered that of the evolution of antiseptic midwifery.

The wonderful success of Lister in his antiseptic treatment of surgical cases, together with the fact that the most eminent pathologists had become convinced that puerperal fever was not an entity, but only the manifestation in the puerperal woman of the conditions long known as surgical fever and hospital gangrene, were the first steps toward an entire change in the prevention and treatment of sepsis in obstetric practice.

In the light of these discoveries, the puerperal woman came to be looked upon as a surgical case, the uterus and the birth-cana being the open surface of the wound, and the rapid advances in surgical technic were followed, with some necessary modifications, by the most advanced teachers of obstetrics.

In the period from 1872 to 1877, I find very little to indicate any systematic use of antiseptics. From 1877 to 1884, however, the development was very rapid, and during this period every kind of antiseptic had its turn, carbolic acid, salicylic acid, permanganate, boracic, and lastly bichloride.

Since the surgical treatment of wounds during this period, consisted largely in douching then with copious antiseptic solutions, the aim of obstetrical technic was apparently to disinfect the lochial discharge by frequent antiseptic douches. Douches were given before, during and after labor. At one time in 1882, I find that intrauterine carbolic douches were apparently the routine treatment at the end of the third stage of labor. Each patient received at least two antiseptic vaginal douches daily during the puerperium, while in case of perineal sutures, these douches were often given every three hours.

For this purpose, it was considered a fine point in antiseptics that each patient was furnished with her own douche tube, but at the same time these tubes were kept loose in a drawer by the patient's bed, with innocent disregard of the colonies of bacteria which might be reposing there.

At this time, hands were washed and dipped in carbolic solutions before and after an examination. There was no systematic scrubbing of the hands, however, and to a majority of doctors and nurses, a rapid dip in the disinfectant solution was supposed in some magical way to rid them from all germs, a fallacy which has not wholly disappeared at the present time.

To show how far the use of antiseptics was carried about this time, I will quote from a paper read by W. Gill Wylie, May 28, 1883. Speaking of his customary routine in private practice, he says:

"First.—The nurse is to give daily carbolic vaginal douches, from one to three weeks before labor, if there is any vaginal discharge.

"Second.—At the time of labor, remove all stuffed furniture, and spray everything left in the room with carbolic solution by the means of a steam atomizer. When labor begins, the spray is to be started in the room, and kept at work during the whole time of labor. All sheets, towels and napkins used about the patient to be sprayed. After labor the genitals are to be washed with carbolic solution and carbolic douches are to be given from two to four times a day during the puerperium. The napkins are to be soaked or sprayed with carbolic and changed every hour or two day and night."

The proof of the success of this method was to be that at no time should the physician be able to detect the ordinary odor of the lying-in room. It can hardly fail to occur to one in reading this, that if any odor except that of carbolic acid were perceptible in the room after this technic, it must have been a very strong one.

The same authority advises in case of septic symptoms appearing, that the vagina should be washed out every fifteen or thirty minutes with a one to forty carbolic solution, keeping this up for two or three hours, and if that does not bring down the temperature, proceed to use intrauterine carbolic douches, which should be given every three hours or oftener.

The only gaseous disinfectant known at this time was sulphurous acid, and this was used to fumigate the wards, and the clothes and persons of physicians or nurses who had been exposed to septic or contagious diseases.

In 1884, I find the first mention of the regular use of solutions of bichloride, which was so much more satisfactory in its effect on bacteria than anything yet discovered, that it was for a time supposed to be infallible. Bichloride douches, bichloride solution for the hands of the physicians and nurses, and for the patient's vulva was the routine employed, and antiseptic pads dipped in bichloride solution were used during the puerperium. The use of bichloride in intrauterine and vaginal douches was more frequent and in stronger solutions than we should dare

to use at the present day. Thus I find records of using several quarts of a one to three thousand solution intrauterine. Numerous cases of mercurial poisoning, some of them fatal, have taught physicians caution in the use of this powerful agent.

I should not wish to be understood as minimizing antiseptics or antisepsis. We all know what a revolution they created in surgery, and the beneficent effects as a whole in the practice of midwifery were not less marvelous. They practically banished puerperal fever as an epidemic, and later I shall show by periods, how not only the mortality, but the morbidity diminished in the antiseptic era.

Meantime, the study of bacteriology was advancing by rapid strides, and the experiments of Koch and others threw new light on many problems hitherto unsolved. The idea that a clean wound would remain clean, and heal by first intention if nothing from without got into it, and that in the same way a puerperal woman's genital organs could recuperate without sepsis, if nothing septic was allowed to come in contact with them, was the starting-point in the effort to replace antisepsis by asepsis.

From 1892 onward, may be regarded as the period of the development of aseptic technic in maternity work. Previously, when septic symptoms developed in the patients in a ward, it was supposed that the infective bacteria were conveyed from one to another through the air, but the bacteriological examination of the hands of doctors and nurses, of dressings, and of the patient's vulva, showed means of infection far more dangerous than simple proximity.

I need not take time to enlarge upon the different means by which sterilization is now carried out. It has been well proven that nothing but prolonged boiling or baking, or the use of superheated steam under pressure can absolutely kill all bacteria. With a good sterilizer, such as every up-to-date hospital now possesses, the sterilization of instruments and dressings is a comparatively easy problem.

Unfortunately, the hands and the patient's vulva can neither be boiled nor baked. We must depend on thorough scrubbing, supplemented by antiseptic solutions, in the hope that the latter will destroy any bacteria which have not been killed by the former. Finally, the use of sterile rubber gloves for the examiner's hands, have been adopted in many lying-in hospitals, as in the surgical wards.

With all due deference to our surgical friends, I maintain

that to conduct a labor aseptically is a much more difficult problem than to perform an aseptic operation. In surgical work, after the proper preparation, the patient is etherized and remains under control until the operation is finished and the wound aseptically dressed. The operator, too, if once sterile, can remain so with comparatively little care. But a woman in labor is far from being an object easily controlled, while the duration of the labor may vary from a few hours to days, during which time the vulva of the patient and the hands of the examiner must be prepared afresh before each examination. The axiom that a person, a dressing or an instrument is only sterile so long as it is not brought in contact with any unsterile objects, is nowhere more difficult to live up to, than in the lying-in room.

In a hospital arranged partly for teaching, as the New England Hospital is, the constantly changing procession of doctors, internes and nurses makes a practically endless chain, and when we remember that no chain is stronger than its weakest link, we can see how one little slip on the part of an ignorant or careless person may destroy the most careful technic.

In 1892, the New England Maternity was removed to its present building, which was erected with great care for the purpose. Even at this date, the idea that maternity wards could not be continuously occupied without danger, led to the building of two wings with the idea that they should be alternately used and left empty. When the great increase in the number of cases made this impossible, there was much anxiety as to the result, but we have lived to see that with the application of aseptic principles, a large number of women can be cared for safely, though only at the price of eternal vigilance.

The present technic of the maternity is briefly as follows:

For hand sterilization a definite time of scrubbing with brush and green soap and soaking in disinfectants and finally putting on sterile rubber gloves. This process is repeated at each examination if the hands have touched any unsterile object. In keeping the hands sterile while waiting for delivery, we have found the use of sterile mittens of duck or linen drawn over the gloves to be very convenient.

We still use, as a rule, permanganate, followed by oxalic and bichloride for hand disinfection. I think we should all prefer Harrington's alcohol solution, but the expense of its free use makes it prohibitive. Where the constant use of bichloride is

found to be very irritating, we have substituted with great satisfaction, the "germicidal disks" of mercuric iodid made by Parke Davis & Co. for the purpose.

The woman is prepared for labor by a bath (shower) and clean clothing, the hair about the labia is clipped, and the inner sides of thighs and the external genitals are scrubbed with soap, bichloride solution, and rinsed off with sterile water, and a sterile pad adjusted. The cleansing of the genitals is repeated before every examination. When the end of the labor approaches, sterile stockings reaching to the hips are drawn on, and a sterile sheet is placed under the hips and over the abdomen to protect the doctor's hands from coming in contact with anything unsterile.

No douches are given before, during or after labor, except on special order. A postpartum vaginal and intrauterine douche is given after any procedure involving the introduction of the hands into the uterus or in case of the birth of a macerated fetus. After labor, the external genitals and vagina are carefully inspected, and any lacerations sutured with catgut or silk-worm gut.

The nurses are expected to rinse off the genitals with sterile water after every urination, and to wash them at least twice a day with bichloride solution, and also after every defecation; this process to be kept up for at least ten days after labor. The perineum is cleansed and kept as dry as possible with sterile mops and pledgets, and the nurse is carefully instructed not to touch the parts with her fingers. Sterile pads are of course worn. No vaginal examinations are made until the beginning of the third week in normal cases, but any suspicion of sepsis is investigated at once, and suitable treatment instituted.

The success of any method is judged by its results, and we will now turn to them. First as to the mortality:

From 1862 to 1872, the period of no technic, the death-rate from sepsis was one in fifty. This frightful record, as we should now consider it, was better than that of the average lying-in hospital of that date.

From 1872 to 1882, during the evolution of the antiseptic treatment, the mortality was one in 212.

From 1882 to 1892 during the full development of antiseptic treatment, it was one in 612.

From 1892 to 1902, during the evolution of aseptic technic, it was one in 1050.

There has been nothing like an epidemic of puerperal sepsis

since 1884. During the last ten years from October 1, 1897, to October 1, 1907, in a total of 2971 cases there has been recorded only one death from sepsis, and that was an eclamptic case, so that the condition of the kidneys probably had quite as much to do with the fatal result as the infection.

But no one should be satisfied with merely showing a small death-rate. What influence has the evolution of the present-day technic shown in the morbidity of the puerperium?

I am not going to waste time in proving that antisepsis and asepsis have been beneficial, but there are still some people who doubt whether the extreme care now taken in every detail of maternity work is needful, or that it pays for the outlay, both in time and money which it demands. For this purpose I bring before you a table which I have prepared from our records beginning with 1872-3, the first year when regular temperature charts were kept.

My plan has been to take the records of one hundred cases each fifth year until 1907, when I have taken the whole number for the year. These cases have been recorded in regular order, and without the slightest attempt at selection. From these I have computed the number where the puerperium was absolutely normal, or if there were any deviation, it was satisfactorily explained as being nonseptic. I have tabulated the septic cases in three grades: the first being those of slight and transient disturbance, the second being more prolonged but not serious in prognosis, while the third includes the cases of marked systemic infection. Finally, in the column marked "doubtful" I have tabulated cases when there has been some departure from the normal, but I have not been able from the history to decide as to the question of sepsis.

Year.	Total number of births.	Number tabulated.	Total non-septic cases.	Septic cases.			
				Slight.	Moderate.	Severe.	Doubtful.
1872-3	95	100	44%	23%	14%	9%	10%
1877	108	100	31%	35%	16%	8%	10%
1882	103	50	62%	16%	10%	6%	6%
1884	108	50					
1887	111	100	70%	13%	8%	1%	8%
1892	177	100	76%	14%	5%	2%	3%
1897	196	100	75%	10%	4%	2%	9%
1902	242	100	84%	8%	2%	1%	5%
1907	483	483	92 + %	1.8%	0%	0.21%	6%

Since, in 1872-3, there were only ninety-five cases, I took five cases additional from the next year to make the hundred.

In part of 1882-3, for some unknown reason, only the temperature charts of patients having high fever were preserved. Therefore, I was obliged to supplement by taking the second fifty cases from 1884.

By examining this chart with its relation to the technic of the different periods which we have studied, we have some criteria for judging the effects on puerperal infection. For ten years, from 1872 to 1882, during which antiseptic treatment was not fully developed, we find a very high percentage of septic cases.

Thus, in 1872, only 44 per cent. were normal and ten doubtful, leaving 46 per cent. showing various degrees of infection. The year 1877 has a still worse showing, only 31 per cent. being absolutely normal. This apparently retrograde record, was probably due to the fact that in 1872 the building was absolutely new, while the effect of five years' maternity work under unfavorable conditions show in the latter record.

In 1882-4, the use of carbolic as an antiseptic was fully developed, and the percentage of nonseptic cases rose at once to 62—double that of 1877.

The year 1887 shows the result of the full development of the bichloride technic, with a nonseptic record of 70 per cent. and a very marked diminution of the severe cases.

The records of 1892 and 1897 show a slight gain in the number of nonseptic cases, but the limit of the benefit of antiseptic technic has apparently been reached, since the last two periods show practically the same results.

In 1902, however, when the results of aseptic technic began to be recorded, our nonseptic record rises to 84 per cent. while almost all the septic cases are of the lightest grade.

In 1907, the number of births was 483, almost exactly double that of 1902, and I have here tabulated the results of all the cases, reducing them to percentages to correspond with the others. Here the nonseptic cases give the gratifying result of 92 + per cent. The only serious case which spoils our otherwise good record, was the result of an error in technic, discovered too late to avoid its effects.

The question as to whether the use of rubber gloves in obstetric work adds to the security of the woman is still under discussion, and therefore it seems important to note that the only

marked difference between the technic of 1902 and that of 1907 is in the use of rubber gloves, so that, to our minds at least, the question is decided in the affirmative.

I do not wish to claim too much for technic. The class of cases coming into the hospital has changed very much within the last twenty years. They are now mostly married women in fairly comfortable circumstances, while formerly they were largely of the unmarried class, and every one knows how much the depression and anxiety which such women undergo increases their susceptibility to sepsis. Again, the knowledge that gonorrhoea is the cause of a considerable number of disturbances of the puerperium, has enabled us to separate those cases where the gonococci have been found in the lochia from those of true puerperal infection. I believe a considerable number of the "doubtful" cases are due to this cause as well as some of the earlier cases before the bacteriological distinction was made.

Again, it may be said, that the science of obstetrics has progressed as well as the technic, and that a portion of the improvement should be ascribed to that. But the most important advances in scientific midwifery of late years have been due indirectly to technic. For instance, the realization that every vaginal examination carried with it the possibility of infection, was a prominent factor in developing external examination, which now forms such an important part of our means of exact diagnosis.

Again, the fact that by asepsis and antiseptics we can do away with so large a part of the danger of operative interference, has developed the science of operative midwifery, so that we no longer hesitate to perform operations before the woman is exhausted by vain efforts to deliver herself.

Thus in the report of 1907 there were sixty-eight operations of various kinds, or about one in seven deliveries, and with the exception of the one mentioned as due to an error in technic, all did well. In fact, it sometimes seems to us that our operative cases make the most satisfactory recoveries.

This paper is not presented with the idea that we consider our results above criticism. On the contrary, we feel that we ought in the next five years to do better still; but as an illustration of the improvement which has been brought about by the evolution of present-day methods in maternity hospitals, we hope that it may be an encouraging and interesting study.

I am greatly indebted to Dr. Stella M. Taylor; the superintendent of the hospital, for her interest and help in searching the records, and to Dr. Hannah G. Myrick for assistance in the compiling of the statistics.

42 NEWBURY STREET.

THE TREATMENT OF ACUTE GENERAL SEPTIC PERITONITIS.

BY

JAMES F. W. ROSS, M. D.,

Toronto, Canada.

Professor of Gynecology, University of Toronto. Chief of Department of Gynecology, Toronto General Hospital.

THE treatment of acute general septic peritonitis must necessarily be medical and surgical; in truth, it should be stated that the treatment should be surgical and medical; surgical in its infancy—at its very commencement—and medical after the case has advanced beyond the reach of surgery, when surgical interference will tip the scale the wrong way. Surgical interference should be carried out as soon as the disease can be diagnosed and, in order that it may be diagnosed early, opiates should be withheld whenever this is possible. "Surgery early and opium late," is what I would advise. When the pulse is very rapid, the extremities cold and livid, the abdomen greatly distended, the knife should not be used; it will do no good and may do very much harm. Even the administration of an anesthetic will do harm to a patient in such a desperate condition. The treatment at this time should be medical, and no better treatment can be adopted than that outlined years ago by Alonzo Clark before the days of surgical interference. By means of large doses of opium we prevent absorption of the toxins and tide the patient over to a rapidly approaching period of immunity or phagocytosis. Many of them that appear to be in a hopeless condition will recover. When I have operated on such patients they have succumbed in a very short time, and I have long since given up the practice. It is unfortunate, however that the patients should reach such a condition without having received the benefit of modern surgical procedures. Operation should be performed early, it should be performed rapidly, it should be performed thoroughly, and the chances of any subsequent infection should be removed by the complete closure of the abdominal cavity. I look upon the most important symptom

indicating the presence of acute general septic peritonitis as rigidity of the abdominal muscles extending over the whole of the abdominal cavity. This is a very marked indication, and can be easily made out by the veriest tyro. A short time since I was asked if it did not require considerable courage to close an abdomen after opening it for the relief of acute general septic peritonitis, and I was forced to acknowledge that it did. In my practice my first closure was brought about as a consequence of a discussion that took place with my house surgeon. I had operated on a young girl who had acute general purulent peritonitis following perforation of a gangrenous appendix. I drained the pelvis and drained the loins and placed over the gauze packing and the tubes, moist dressing with rubber dam to facilitate drainage. For a few hours there was a fair amount of discharge from each of the three openings, and then all drainage ceased. The house surgeon asked why drainage was used under such circumstances when the object for which it was instituted was not attained. The bowel soon looked dry over the inflamed area. In the next similar case I closed the abdomen after evisceration or as much evisceration as occurred as a consequence of a very thorough flushing of the abdominal cavity, and the patient made an uninterrupted recovery. I have carried out this procedure in a number of cases since. The same procedure has been carried out by the assistant in my department in the Toronto General Hospital and by several professional friends, and with entirely satisfactory results. Neither drainage nor posture have been instituted. In some cases the wounds healed, in others they broke down either throughout their whole extent or in part, owing to the virulence of the infective material. The intestines should be handled as little as possible, no lymph should be removed, and evisceration should only be permitted as it is considered better to allow the intestines to slip out than to attempt to replace them during a thorough flushing and in order that all pockets may be disturbed and cleansed. If the patient appears shocked during this procedure, the insertion of two fingers on either side of the cut surface and the upward lift of the abdominal wall, as if lifting the patient off the table, by overcoming the rigidity of the muscles, will almost instantly return the extruded bowels. The flow of warm saline solution prevents erosion and damage of the endothelial cells and also prevents the abstraction of heat from the exposed surface. All hidden collections of infected seropus

must necessarily in this way be removed and the saline solution has a sterilizing effect. In the abdomen there are five pools; one behind the liver, one behind the spleen, one in each loin and one in the pelvis. When washing, it will be noticed that the saline solution becomes stained with the pus whenever the blunt trocar is passed into one of these pools. The water may appear to run quite clear and then become turgid as soon as the trocar is placed to the depth of the pelvis, and the same happens when it passes to the posthepatic or postsplenic or other pouches. The intestines should not be rubbed with sponges, towels or rubber-gloved fingers, and no attempt should be made to remove the excess of saline solution after a thorough lavage. The source of infection should always be hunted for and closed off either by means of accurately approximating sutures or, when this is not possible, by means of a protective Mikulicz gauze packing. It is only under the latter circumstance that any packing need be used in the abdominal cavity, and this packing is not intended to act as a drain, but to shut off a dangerous area—an area of repair of which the operator is doubtful.

At the time of making my report I had thirty-seven deaths and twenty-five recoveries in all, an apparently appalling record; but when this was further analyzed I found that in the first series there were twenty-six deaths and four recoveries; in the last series of thirty cases, there were ten deaths and twenty recoveries. Of the last eleven cases there were nine recoveries; one of the deaths in this number was a foregone conclusion, being a case upon which operation should not have been performed, as the man had had hydrochloric acid poured out through a large perforation of the stomach, irritating his abdominal viscera for twenty-four hours. Since the date of that article I have treated the following cases:

No. 1535, Noble died.

No. 1574, Jones recovered.

No. 1614, Brady recovered.

No. 1624, Bliss recovered.

Dr. Marlowe, the assistant in my department at the Toronto General Hospital, has operated on eight cases with thorough lavage and closure with recovery in each case. Taking his experience with mine would show for the method advocated five deaths and twenty recoveries in the last twenty-five cases treated. From what I can hear from others, the results claimed

for pelvic drainage and Fowler's position have not been obtained by them.

The striking difference in the results in my former and more recent practice is due to several factors. First, non-interference in moribund cases; second, early interference; and, third, improved technic. Until vaccines have been developed with which the resisting power of the blood can be raised above the normal and a rapid condition of phagocytosis or immunity produced, we must continue along the old lines of treatment, and while this is so we should endeavor to improve them as much as possible. The treatment should be carried out as follows: The abdomen should be opened by a free incision, the site of infective invasion should be found and dealt with, the abdominal pools should be most thoroughly irrigated, taking no heed to the escaping intestines unless forced to do so by signs of shock, when irrigation should be suspended for a time and the escaping intestines should be returned as indicated above. In a few minutes the shock will cease and the irrigation can then go on as before. Normal saline solution should be used for purposes of irrigation. I have been in the habit of using subcutaneous saline injections and also irrigation by the rectum, but it is difficult to say whether this is beneficial or not as the cases recover and many cases recover without it. I administer morphin in large doses as soon as the patients are placed back in bed, and they are kept thoroughly under the influence of this drug. The abdomen is closed and no drainage is used. No special posture is adopted.

As a pupil of Lawson Tait, I was imbued with many of his ideas, but am now satisfied that his treatment of acute general septic peritonitis by the administration of purgatives and the adoption of strenuous measures to obtain the evacuation of the bowels was harmful and not to be recommended. The administration of purgatives at such a time prevents the very peristaltic rest prescribed by nature's efforts and increases the risk inherent upon the reopening of the original site of infection. Years ago I ordered the pumping into the rectum of large enemas, administered enormous doses of nauseating purgatives to the patient's discomfort and without attaining the desired end. Exhaustion was increased in an effort to remove stubborn nature's splints. A great deal of energy has been directed against the so-called intestinal paresis; when it has set in, it is impossible to move the bowels, and I have come to the con-

clusion that it is the better practice not to try. In a few days, the bowels will move without any assistance from the attendant physician or surgeon, and soon a colliquative diarrhea will take the place of what was previously an obstinate constipation, unless the patient succumbs in the meantime. It is much easier to interfere at an early stage than it was a few years ago. The public has become educated to the benefit of early operation.

When operation is not carried out with thoroughness, it is unfortunate to have the patient succumb from what may be called residual peritonitis from undiscovered pockets. Unless the surgeon has performed a very thorough operation, this is liable to occur. Two openings are not required for a thorough flushing of the abdominal cavity. The intestine should not be damaged by puncture or incision. The surgeon who can wash an abdomen *thoroughly* without permitting any escape from time to time of coils of intestine, is not living just now. It requires more handling of intestine during lavage to prevent the escape of the intestines than when a partial evisceration is allowed to take place. As the fluid is poured into the abdominal cavity the intestines float upward and slip out through the large incision that should be used, and if the solution is warm and poured out rapidly, but little attention need be paid to extruded bowels. It is the awkward attempt to slowly replace them that causes the damage, and I desire again to refer to an easy method by which this can be successfully and rapidly accomplished. The abdominal wall must be lifted upward, and if lifted upward with sufficient force, the intestines, owing to the length of the mesentery, must necessarily drop back. I have demonstrated this fact to house surgeons, anesthetists and others from time to time to their entire satisfaction.

Lymph cannot be removed by a stream of water. The separation of two inflamed intestines from one another will leave each with its own lymph attached and no attempt should be made to remove it. One must not consider the condition of the pulse during operation, as it will become elevated under the stimulus of the hot saline solution, and it is of very vital importance that the operation should be thoroughly completed. Washing with a jug or pitcher is to be deprecated. The tubes used from douche cans are frequently too small; nothing but a large tube, a large-sized blunt-pointed large-opened trocar will reach the peritoneal pools with sufficient rapidity and thoroughness. The intestines always look angry and red and may appear to be

almost gangrenous in spots, and yet such cases will do well after the intestines have been returned and the wound in the abdominal wall completely closed without drainage of any sort.

In Mr. Bond's paper, he says, "If evisceration and complete washing of the intestinal coils are ever justifiable, it must perhaps be in those a most hopeless cases of streptococcus pyogenes infection in which the patient dies within a few hours of seizure from rapid poisoning without reaction or attempt at phagocytosis."

I cannot see the force of his argument. Such cases must necessarily be operated on at an early period—that is, before death; and as all cases of acute general septic peritonitis should be operated on early, I fail to see how the surgeon is to discriminate between the cases that Mr. Bond says may be eviscerated and washed and those in which he would strongly condemn such a procedure. I have used the method outlined above, my assistants have used the same method, many others here and there have also adopted this method of evisceration and lavage and closure with gratifying results. We are told that there are ascending mucus currents in the uterus and Fallopian tubes rushing onward to such an extent as to carry the dreaded pneumococcus from the vagina into the peritoneal cavity, and yet at the same time we are asked to believe that in all these cases of general inflammation a stab puncture of the cul-de-sac of Douglas with the insertion of a drainage-tube and an erect posture will soon overcome the intraabdominal streams. At another place Mr. Bond says, "There is little doubt that in the majority of cases of moderately virulent infection, such, for instance, as those arising in connection with a gangrenous or perforated appendix, the cost of interference is too great. Evisceration is fatal, while free and forcible irrigation is apt not only to wash away the defending phagocytes, but also to spread the virulent organisms from the primary focus over the whole area of membrane already taxed to the uttermost to repel the invasion." I agree with him, but such a case is not one of acute general septic peritonitis, because the virulent organisms are not spread over the entire peritoneal surface, and such an example must, therefore, be thrown out of court in any argument as to the efficiency and life-saving properties of evisceration and irrigation in acute general septic peritonitis. Such are cases of localized septic peritonitis, and I would not dream of carrying out a general irrigation, with or without evisceration in any of

them. The interference with the diaphragmatic zone is another theoretical bugbear. I always pass a large blunt ovariectomy trocar behind the liver and behind the spleen without the ill consequences that theoretically should ensue. It is a well-known fact that any handling in this area, even in a healthy patient, is accompanied by a certain amount of shock, not due, however, to any excessive absorption through the lymphatics of the diaphragm, but to the irritation produced in the neighborhood of an enormous nerve-plexus. And why should drainage be instituted? What more can be accomplished with it than without it? Do drains drain? When drainage-tubes are placed or gauze packings used, adhesions soon form and the main peritoneal cavity is shut off. Little else is accomplished except the possible contamination of a small quantity of fluid at the end of a very small pouch. There is a great difference between the pleural cavity and the peritoneal cavity. In the pleural cavity the movements of the box of the chest have a tendency to empty it with each full inspiration, and drainage is easily effected by the removal of a portion of a rib. In the abdominal cavity matters are different and, on account of the complex arrangement, it is impossible to institute thorough drainage. I am satisfied that neither the pelvic drainage, loin drainage nor posthepatic nor postsplenic drainage, with or without Fowler's position or any other position, will drain the peritoneal cavity. Fluid will collect among the intestinal coils, and all that we can do as surgeons is to wash it out, replace it by a somewhat antiseptic, nonirritating sterile solution in the hope that the poison will be so much diluted that the phagocytes will be able to deal with it. The phagocytes are the corporal guards posted at all the outlying stations, and in the omentum they seem to bunch up at the lymphatic stream-junctions until the clusters can be discerned with the naked eye. The omentum plays a most important rôle; it is the sluice-gate of the peritoneum, and that it performs a very important function can be judged from the great changes that take place at a very early period in the omentum in cases of acute general septic peritonitis. I am afraid that it would take more than hot saline rectal injections to divert the upward flow of the omental lymph stream. That an immunity or phagocytosis is established and that large quantities of septicly infected fluid become sterile must have been impressed on all operators of experience in this branch of surgery. It frequently happens that large collections of fluid are met with in one or other of the

abdominal pools many years after the patient suffered from a severe attack of general septic peritonitis. The fluid shows that the illness was a desperate one and, in fact, operation may be undertaken as a consequence of the presence of some ill-defined thickening in the pelvis or loin, and it is not until after the abdomen has been opened that the riddle is read. These pools I have met with in cases that I attempted in my ignorance to drain at the time of the primary operation. When drainage is instituted, convalescence is impeded, much discomfort to the patient is produced, subsequent herniæ are liable to result, and there is an added danger of further infection from a multiplicity of wounds.

The sitting posture has taken such a hold on the profession that operations are performed with the patient in this posture, and the patients are then carried back to bed while still in this position, although before operation they have been allowed to lie, alas, for days with septic fluids flooding all areas. But the position is supposed to obviate all this and I am afraid that even poor Fowler died in the position in which he placed so much confidence. It is said that the enfeebled heart acts better when the patient is in the erect posture.

The elimination of toxins by the addition of large quantities of saline solution to the blood has been heralded abroad among the profession, but I have yet to learn that any research-worker has demonstrated it as an actual fact. I use the saline solutions, accepting blindly, like many others, suggestions that fall by the wayside, but am not convinced that this subcutaneous and rectal treatment does what is claimed for it. I do not believe that there is an increased risk in a case of acute general septic peritonitis of absorption from any one zone over any other zone. Zones are all equally bad, and were it not for certain compensating factors the infection of any of the zones would prove fatal.

The mere opening of the abdomen is not sufficient to relieve the intraabdominal pressure, the abdominal muscles will be as much on guard as before and the pressure will still continue unless the intestines are extruded from the cavity.

It became fashionable to condemn opium after operation because it did so much harm before the surgeon saw the case by masking the symptoms and instituting a false security. But in cases beyond any hope from operation, and in all cases of acute general septic peritonitis after operation, I use opium in very large quantities until the respirations are reduced to about

ten per minute, and until the patient appears to be well narcotized. Pain is relieved, the pulse-rate is reduced, and I believe that the most important feature is that absorption is retarded.

Gonorrheal peritonitis seems to differ from other forms. It is questionable whether interference is advisable or not. Interference is liable to produce a wide distribution of this virulent poison and to favor a greater amount of absorption. Adhesions appear to form more rapidly in cases of gonorrheal infection than in other forms of peritonitis and here a distended abdomen, high temperature and rapid pulse do not seem to indicate as frequently a fatal termination as in the other forms of peritonitis. Absorption appears to be retarded owing to the rapid formation of adhesions. In cases of acute general gonorrheal peritonitis in which the aid of surgery has been invoked, my experience has not been assuring, while the results in such cases when treated with rest and opium have been very gratifying.

The patients under my care are allowed to adopt any posture that suits them, but they are not allowed to sit up.

And now in closing, allow me to say, that I reached the conclusions embodied in this imperfect and necessarily short discussion of an important subject after years of practical experience, and can conscientiously advise a younger generation of surgeons in the treatment of acute general septic peritonitis above all *to operate early, to incise amply, to repair carefully, to wash thoroughly, to manipulate gently, to perform rapidly, to close completely* and then to narcotize deeply. In my opinion all else will be of secondary importance in the present state of our knowledge.

487 SHERBOURNE STREET.

ENDOMETRITIS EXFOLIATIVA—DYSMENORRHEA MEMBRANACEA.*

BY

HUGO EHRENFEST, M. D.,

St. Louis, Mo.

Associate Professor of Gynecology and Obstetrics, St. Louis University.

(With four illustrations.)

From the Pathologic Laboratory of St. Louis University.

THE recent investigations of Loefquist (1), Theilhaber (2), Schwab (3), Hartje (4), Schick (5), and especially the various contributions of Hitschmann and Adler (6,7,8), are speedily

* Read before the American Gynecological Society at Philadelphia, May 26-28, 1908.

leading to radical changes in the common views concerning the pathology of endometritis and the histology of menstruation. Hitschmann and Adler have established the striking fact, that those well-known histologic pictures, which heretofore have been regarded as characteristic of either endometritis glandularis or interstitialis, are typically found in the normal and healthy endometrium during the various stages of the menstrual cycle.

These writers presented their first contribution at the twelfth meeting of the German Gynecological Society, in Dresden. A brief abstract of their paper, which shortly afterwards appeared in the *Zentralblatt für Gynäkologie* (June 29, 1907), conveyed such a clear idea of their important findings that the thought at once suggested itself to me that this new knowledge of the histology of the menstruating endometrium probably will solve the much mooted question of the etiology and pathology of dysmenorrhœa membranacea.

My investigations were practically concluded and the sketch for this paper almost finished when I found Hitschmann and Adler's latest publication in the February (1908) number of the *Monatsschrift für Geburtshilfe und Gynäkologie*, entitled: "Dysmenorrhœa membranacea." I wish to state here that my own findings and deductions in all essential points confirm their views; some differences will be pointed out later.

It has been my intention to show in this paper, from the extensive literature on the subject, how we are at present forced to return to the antiquated conception of an at least partial exfoliation of the endometrium during menstruation. This also has been done in a most convincing manner by Hitschmann and Adler in this recent paper. It is well known that this theory of a partial destruction of the uterine mucosa during menstruation was placed on a sound scientific foundation by the classic work of Kundrat and Engelmann. Gradually, however, it has been discredited by the writings of other investigators, especially by Gebhard. The description of the menstruating endometrium, as given by Gebhard, today is found in every text-book of gynecology, but beyond any doubt it is faulty in its most important points.

This paper is based upon the histologic examination of eight membranes obtained from three patients.

The first membrane is from a patient, married seven years, who was sterile. She menstruated very regularly. Once she went over time eight days. Her flow started and continued scant-

ily for five days, then became more profuse for another six days. She suddenly had crampy pains and on the next day had found on her napkin a little membrane. A section showed an endometrium of approximately normal thickness, with typical sub-epithelial hemorrhages and occasional decidual-like cells.

The differential diagnosis between an exfoliated menstruating endometrium and a very young decidua in this particular case was of extreme practical importance, because both the patient and her husband were unusually anxious to have a child and at that time were seriously thinking of adopting one. Fetal

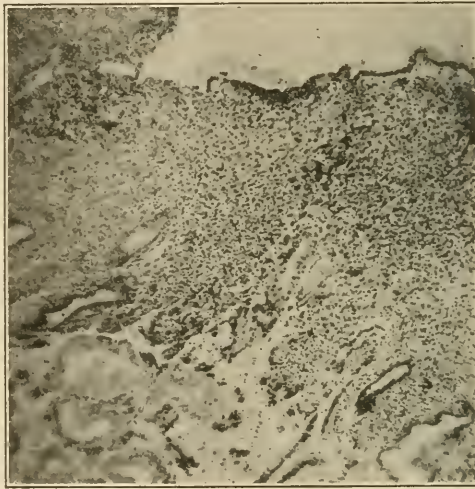


FIG. 1.—The mucosa is divided into a superficial compact and a deeper spongy layer. While in the superficial layer the glands stand farther apart than in the normal endometrium; in the deeper layer the glands are dilated and the amount of interglandular tissue reduced. (Enlargement 50.)

tissue, in spite of very careful search, was not found in any of the sections. The opinions of various men who saw the sections were divided. Some considered it a menstrual membrane, others and I myself a true, very young decidua. A section was sent to my friend Dozent J. Pick, of Berlin, who declined to make a positive diagnosis, but favored the idea of an early abortion. About a year later this patient became pregnant and since has given birth to a child. This, in my belief, confirms the diagnosis of true decidua.

The second membrane was obtained from a woman, also married seven years, who was sterile and very anxious to have a

child. It may be stated that this patient was an intimate friend of the patient mentioned in the preceding history. For the last five years her menstruation was rather irregular, often being delayed from two to four weeks. After such delay the next menstruation usually would be of the regular type, rather scanty, lasting three to four days, never accompanied by any pain. About five months after her marriage she was affected with what her physician at that time called "abscess of the womb." I could find no plausible cause for the sterility on examination, although some difficulty was experienced in passing

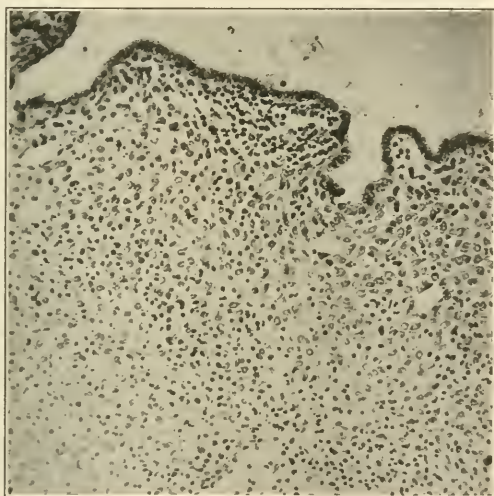


FIG. 2.—The superficial layer of the menstruating endometrium contains numerous typical decidual cells which often are grouped around the capillaries. The surface epithelium is well preserved. (Enlargement 125.)

a uterine sound through the internal os. Eighteen months later this patient brought a membrane to my office with the following history: Of late menstruation had been rather regular. Only last time she went ten days over the time. She had some crampy pain, then the flow started and a few hours later she found the little membrane. She had looked for it, being well acquainted with the experience of her friend.

Although in this case the clinical picture spoke less in favor of an abortion than in the first mentioned case, the microscopic examination of the discharged membrane left no doubt concerning the diagnosis. No fetal elements were found, but the

membrane showed in all portions a complete transformation of the stroma cells into typical decidua cells. In the compact layer the glands had almost disappeared.

The six other membranes were obtained from a woman, thirty-seven years old, who undoubtedly was suffering from a dysmenorrhœa membranacea, although clinically her case was not exactly typical.

She was married twenty years and to her knowledge pregnant twelve times. Four times she carried to full term, the last seven years ago. Eight pregnancies ended prematurely, the

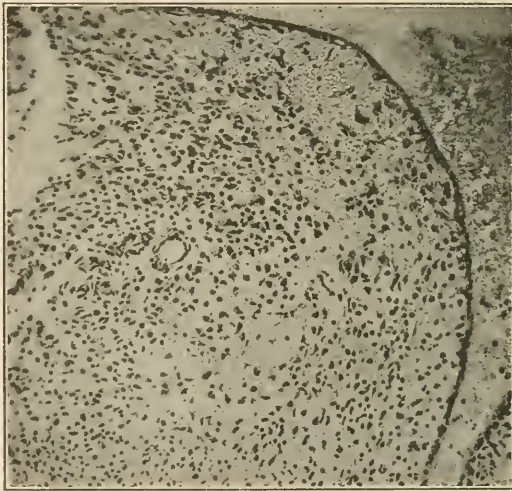


FIG. 3.—Extravasated red blood-cells and mono- and polynuclear lymphocytes, together with the decidual reaction of a large number of connective-tissue cells, in the upper stratum of the menstruating endometrium increase the amount of interglandular tissue. The surface epithelium is well preserved. (Enlargement 125.)

last six years ago in the third month with the expulsion of twins. She was menstruating very regularly, every four weeks. Her flow varied greatly in intensity, but she never had the slightest pain or even discomfort during menstruation. According to her statement, she realized that she is menstruating only by the fact that she "felt wet."

Incidentally she informed me at the time of the first consultation that for the last several years she has observed that a "skin-like" structure is expelled with the menstrual flow, whenever she had even only one cohabitation during the preceding month. This membrane in her belief is an aborted ovum, which passes

without any pain usually on the second day of menstruation, accompanied by a little larger amount of blood. It may be stated here that the immediate cause of her consultation was a cystitis, undoubtedly due to a gonorrhoea, acquired from her husband about a year ago. The fact that she is passing these membranes was only accidentally ascertained while taking the history.

Gynecologic examination yields the following result: Perineum in very good condition. Posterior vaginal wall slightly relaxed and descended. Cervix large, slightly lacerated, exter-

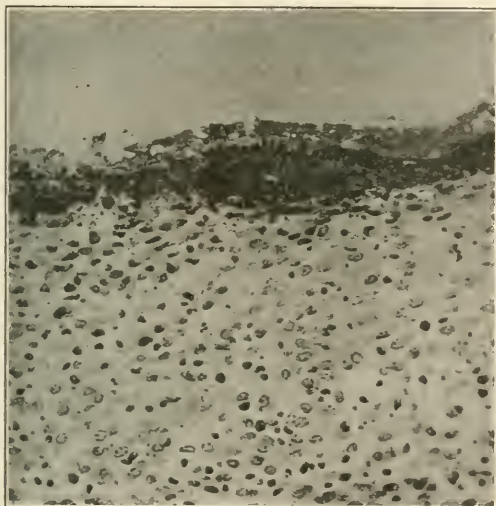


FIG. 4.—The surface epithelium, which in general is present to the greatest extent in all sections of all membranes, at times is detached from the underlying tissue by a narrow band which consists of red blood-cells, in other places of some tissue in hyaline degeneration. (Enlargement 150.)

nal os gaping. Uterine body of normal size, in freely movable anteversion. Both uterine appendages apparently normal. There is no tenderness except on pressure against the trigonum.

The first membrane brought by the patient was examined for diagnostic purposes. The microscope showed conclusively that it was not a decidua. The membrane exhibited the picture of an interstitial endometritis and at that time a diagnosis of endometritis exfoliativa was made.

For experimental purposes the patient next was instructed to refrain from cohabitation, which was easily accomplished, because at that time her husband had taken a position out of town.

Membranes continued to pass and the fact was established beyond any possible doubt that the expulsion of these membranes positively was independent from coition or the possibility of impregnation. These membranes were expelled at almost every menstruation, and five of them subjected to a careful examination for the purpose of comparing them with the description given by Hitschmann and Adler of the normal endometrium during menstruation.

The findings were practically identical in all membranes and can be briefly described as follows: The superficial epithelium is in almost all sections of all membranes preserved to the greatest extent. As a rule, it is cylindrical, with the nucleus in the middle of the cell, as is characteristic of the endometrium. In some sections it is more cuboidal. The subepithelial hematoma in many sections is visible as a long, narrow band of almost uniform width which detaches the surface epithelium often for a long distance. Wherever the epithelium is thus detached, the contours of its cells are indistinct, the epithelium apparently being in the state of a beginning necrosis. The subepithelial hematoma is missing in many sections. In the superficial portions of the endometrium the decidual changes are well marked in many of the stroma cells. Especially around the greatly enlarged vessels clusters of these typical epithelioid cells can be seen. A zone of protoplasm surrounds the large nucleus, which takes the stain poorly. The stroma contains a large amount of extravasated erythrocytes and of mononuclear and polynuclear lymphocytes. In the superficial portions of these membranes the glands are narrow, rather straight and stand farther apart from each other than in the normal non-menstruating endometrium. Distinctly different is the histologic picture of the deeper portions which, however, are preserved and visible only in some sections. Here the lumen of the irregularly-shaped, indented glands is greatly widened. The glands are lying nearer to each other, the interglandular tissue being distinctly lessened. Decidual-like cells are extremely rare in this portion of the membrane. In many sections blood is seen to adhere to the ragged, uneven edge of the membrane where it has become detached.

If we compare these findings with the description and splendid illustrations presented by Hitschmann and Adler in their paper "Structure of the Endometrium in the Mature Woman Especially During Menstruation" (7), we cannot fail to recognize that they are practically identical with those representing the

endometrium just before menstruation. These two writers have conclusively shown that at that time the increased size of the glands in the deeper layers of the endometrium produces that picture which has been considered characteristic of endometritis glandularis hypertrophica. In the more superficial layers, on the other hand, the amount of interglandular tissue is greatly increased as the result of both the decidual changes in a large number of stroma cells and of the extravasation of erythrocytes and lymphocytes. The glands themselves are compressed and pushed farther apart. Thus the picture of an endometritis interstitialis is produced in the more superficial portion of the endometrium. Or, in other words, the endometrium during menstruation, like a true decidua, is composed of a compact and a spongy layer. In all five membranes these two strata are distinctly differentiated, wherever a portion of the spongy layer, within which the detachment occurs, was preserved.

Interesting in my case is the extensive preservation of the surface epithelium in almost all the membranes. Hitschmann and Adler state that they have never found the surface epithelium in any of the many membranes examined by them. As stated above, the epithelium in my sections often was seen detached for some distance by a long ribbon-like hematoma, and in these instances the epithelium showed signs of a beginning necrosis. There is no doubt, that my membranes then represent a somewhat earlier stage of menstruation. It can be assumed that if the detachment of the membrane would have occurred possibly only twenty-four hours later, the epithelium would have been lost. And this point brings up the last question to be considered, namely, the cause of the exfoliation and extrusion of these membranes.

The idea that this process is the result of acute or chronic inflammation is untenable in the light of the findings of all recent investigators. An endometritis exfoliativa which leads to the expulsion of the endometrium during menstruation does not exist. It has been shown in my case that exactly as in those of Hitschmann and Adler the dysmenorrhic membrane exhibits the characteristic picture of the menstruating endometrium. On the other hand, satisfactory proof has been furnished of late that during menstruation at least a portion of the uterine mucosa is exfoliated. We thus seem forced to the conclusion that the expulsion of the whole endometrium during menstruation is not a pathologic, but only the exaggeration of a normal physiologic process.

Hitschmann and Adler assert that the underlying cause for a very extensive or complete exfoliation of the uterine mucosa is found in the differentiation of the endometrium during menstruation into a compact and a spongy layer. This explanation seems acceptable. The formation of the spongy layer certainly loosens the normal attachment of the mucosa. The term "exaggeration of the normal, physiologic process" then refers, first of all, to an unusually marked development of a spongy stratum during menstruation. This could be the result of structural variations of the endometrium which still lie within physiologic limits or may be the expression of an abnormally strong reaction of the endometrium to the chemic impulse sent out by the ovaries, according to that interesting theory evolved by Halban (9) concerning the internal secretion of the ovaries.

There remains then to be explained the immediate cause of the detachment. Hitschmann and Adler do it in the following way: If a small clot of blood or fibrin blocks an even normally wide internal os and prevents the free escape of the menstrual blood, the uterus will respond with contractions. The stronger these contractions are and the better pronounced the differentiation of the endometrium into these two layers is, the more likely is the detachment.

In this explanation of Hitschmann and Adler, strong uterine contractions form the essential factor in the process of exfoliation and it is obvious that they consider the mechanism of the separation of the endometrium practically identical with that which leads to the detachment of the placenta post partum.

This analogy, in my opinion, does not exist. The placenta becomes detached after the expulsion of the fetus because the area of its attachment to the uterus suddenly is reduced to a fraction of its former size. Such a disproportion of surface between endometrium and uterine wall certainly does not develop during a contraction of the small menstruating uterus.

Hitschmann and Adler's theory, furthermore, does not seem applicable to the not uncommon cases in which, like in mine, the endometrium is exfoliated without any pain. It seems inconceivable that strong uterine contractions could occur without causing the slightest discomfort.

Against this theory finally speaks the disappointing but common experience that, as a rule, the usual treatment of dysmenorrhea membranacea, consisting in wide dilatation of

the cervix and curettement, leaves the condition practically unchanged.

In my opinion, the immediate cause of the detachment, like the already-mentioned underlying cause, is found in the structural peculiarities of the menstruating endometrium.

In the spongy layer of some of the membranes examined by me the interglandular septa often are extremely thin; indeed, here and there the basis of the epithelial lining of one gland almost directly touches the lining of an adjoining gland. These thin septa which effect only a loose connection of the endometrium with the uterine wall, in my belief, under certain conditions may be extensively destroyed either by excessive compression or by an interstitial hemorrhage, often probably by both processes. The compression of the gland ducts in the superficial layer of the endometrium during menstruation produces a retention of secretion in the cecal ends of the glands. It is this process which leads to the differentiation of a spongy layer during menstruation. The greatly distended glands of the deeper layer press against the interglandular septa, and I assume that an excessive pressure exerted in this way occasionally, may result in the degeneration or necrosis of such septa. If during this process blood-vessels are destroyed, a hemorrhage will occur and obviously the escaping blood will develop into a submucous hematoma by following the path of least resistance along the spongy stratum. The idea of a submucous hematoma as the immediate cause of the detachment of a dysmenorrhic membrane is not new, thus Gottschalk (10) spoke of a thrombosis of endometrial vessels. Such a theory finds further support in the histologic findings. In describing my sections, I have mentioned the fact that often blood is found firmly adherent to the fragments of the spongy layer seen in some of these sections.

If these detached membranes are small or the cervical canal wide, they probably are carried away with the escaping blood and pass unnoticed. Only if there is a disproportion between the size of the membrane and the internal os of the cervical canal, painful uterine contractions become necessary for its expulsion, and we then have the typical clinical picture of a dysmenorrhea membranacea.

The deductions which can be drawn from these investigations may briefly be summarized as follows: Membranes expelled during menstruation in cases of so called dysmenorrhea membranacea show the typical histologic picture of the normal endome-

trium during menstruation. They resemble so closely very young true decidua that at times a positive differential diagnosis becomes impossible. The exfoliation of these membranes is not the result of an inflammatory process, but is due to an exaggeration of certain normal and physiologic changes in the menstruating uterine mucosa. At this time the endometrium is divided into two distinct layers, a compact and a spongy stratum. This differentiation is the essential factor in the process of exfoliation. The actual detachment is probably effected by degenerative processes or hemorrhages which destroy the thin interglandular septa of the spongy layer. If the internal os of the cervical canal is too small to permit the unhindered passage of the detached membranes, they are expelled by strong and painful uterine contractions.

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- 4619 MCPHERSON AVE.

HEART DISEASE AND PREGNANCY.*

BY

J. CHALMERS CAMERON,

Montreal, Canada.

Professor of Obstetrics, McGill University.

THE mutual relationship between heart disease and pregnancy should interest every medical man, whether he is engaged chiefly in obstetric practice or whether he is devoting himself mainly to general medicine. The physician should be able to forecast the probable effects of pregnancy and labor upon those of his patients who are suffering from heart trouble, while the obstetrician should know how endocarditis and chronic valvular disease

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may modify or derange the course of pregnancy, labor and the puerperium in patients whom he is expected to confine. Unfortunately, professional opinion regarding these matters, as a rule, is rather vague and uncertain, partly because of the persistence of certain venerable traditions and partly because teachers and text-books have devoted too little attention to the subject. They have not taught us clearly enough that the various forms of heart disease affect pregnant women in different ways and that it is fundamentally important to make an exact diagnosis before we attempt treatment. We cannot, even approximately, estimate the risks and dangers run by such patients or lay out a rational line of treatment for them until we have made out the condition of the heart and estimated the degree of compensation present, as well as the probability of its continuance. It used to be a common belief among the laity that heart troubles are rare in pregnancy, that such patients have a certain immunity from pregnancy and that even if they do become pregnant their cardiac troubles may improve or, at any rate, will not become worse. Routine examination of hospital cases shows that heart troubles exist in from 1 to 2½ per cent., while clinical experience demonstrates that cardiopaths are not unusually sterile, that they are not especially liable to abort, and that the majority of them may bear a living child safely, especially in their first pregnancy; but it is also certain that each recurring pregnancy aggravates their heart lesion and increases its dangerousness, and that disastrous results are most apt to occur in those women who have been weakened by several pregnancies occurring in rapid succession. Indeed, it is not uncommon for women to go through one pregnancy or even several without the existence of a heart lesion having even been suspected; this is particularly apt to occur in cases of mitral incompetence with good compensation. A routine examination of the heart in all pregnant women would not only make such an oversight impossible, but would also show how frequently cardiac complications do exist and how a little care will generally enable us to deliver such patients safely. Although it is undoubtedly true that endocarditis and valvular disease are serious complications of pregnancy, needing constant watchfulness and care, yet nevertheless it is equally true that the danger has been very much overrated and that the presence of heart disease is not a necessary nor even a very frequent indication for the induction of abortion or premature labor.

Causes and Course.—A cardiac lesion may have existed before pregnancy began; in such a case it may be said that pregnancy complicates the heart disease; or the cardiac trouble may have been latent, and by pregnancy it is developed and made known. Finally, it may begin during pregnancy or the puerperium, and then it must be considered a complication of pregnancy. In the latter case it is the result usually of rheumatism or some other intercurrent disease, or has been produced by toxemia or septic infection. But whatever may have been the cause, the heart lesion is always aggravated by pregnancy, especially after the fourth or fifth month, while, on the other hand, the course of pregnancy may be more or less seriously affected by it. There may be a miscarriage; or, if the patient reaches term, she may die during or after labor or in the puerperium; or even if she escapes with her life, she may be left with a crippled heart, more or less of an invalid for the rest of her days.

It is not hard to understand why pregnancy affects heart troubles injuriously. In the nonpregnant state, when an attack of endocarditis leaves a valve contracted or incompetent, the circulatory balance is restored and maintained by a compensatory hypertrophy. But when pregnancy occurs in such a case, it complicates matters by calling upon the heart for still more compensation while the conditions are becoming less and less favorable for such repair with the advance of pregnancy. Tension is increasing, the nutritive quality of the blood is impaired, since it must not only provide material for the growth of the fetus, but must also carry off the increasing amount of waste matter eliminated by it. The enlarging uterus and the increasing intraabdominal pressure crowd up the diaphragm, displacing the heart, preventing the full expansion of the lungs and consequently limiting their oxygenating power. It is easy to understand, therefore, how it becomes increasingly difficult to establish and maintain compensation as pregnancy proceeds. It may be urged that some observers deny the existence of cardiac hypertrophy in normal pregnancy, claiming that the increase in the area of cardiac dullness is due to upward displacement of the heart and not to hypertrophy. Other observers, too, assert, as the result of experiment and actual measurement, that the lung capacity remains constant in normal pregnancy. But it is hard to admit the validity of such claims, when every day we see for ourselves how easily breathlessness on exertion is produced and how quick and shallow the respira-

tion usually is in pregnant women. As the result of clinical observation, it seems only reasonable to infer that the capacity of the lungs is decreased and expansion becomes limited directly in proportion to the growth of the uterine tumor. It is also well established clinically that in cases of pregnancy complicated with heart disease, it is rare to find urgent dyspnea in primigravidæ, and that when it does occur in multigravidæ it begins usually about the fourth or fifth month and becomes more distressing as the abdomen enlarges, and that very slight causes may then produce heart failure.

Prognosis.—As regards their degree of dangerousness, cardiac lesions in pregnancy are usually arranged in the following order: *mitral stenosis*, *aortic insufficiency*, *mitral insufficiency* alone or complicated with stenosis or some aortic lesion.

Practically, however, such a classification must be accepted with caution, for it is difficult or impossible to base a prognosis merely upon the kind of valvular disease present in any given case. The primiparity or multiparity of the patient, her general health and nutrition, the condition of the kidneys, the amount of compensation present and the ease with which it is upset or restored, the patient's ability to remain quiet in bed free from exertion or excitement, and the way in which she responds to treatment—all these things are of more importance in estimating the probable result than the kind of anatomical lesion present.

Mitral Stenosis.—Since less blood than usual passes through the narrowed mitral orifice, such patients, as a rule are poorly nourished, weak and anemic. In labor, the first stage does not cause any particular distress; not until the bearing-down pains of the second stage begin, do symptoms of constitutional disturbance appear. Then, the glottis being closed, the lungs tense with air, the diaphragm depressed, the uterus and abdominal muscles in strong and frequently recurring contractions, an increased amount of blood is driven into the veins and forced along toward the already engorged right heart. Relief cannot come from the front, because the narrowed mitral allows but an insufficient quantity of blood to pass through into the left ventricle, and the blood is dammed back upon the left auricle which consequently distends, thus offering still greater resistance to the unloading of the lungs and engorged right heart. The symptoms, therefore, are decreased blood-pressure, an irregular, small, rapid, flickering pulse and cyanosis which tends to increase. The character of the pulse is explained by the fact that enough

blood does not enter the left ventricle for it to pump a full stream, and the cyanosis is explained by the increasing engorgement of the right heart. As the bearing-down efforts continue, the strain increases, and narcosis or death may occur if the tension is not relieved. At the close of the second stage, if free hemorrhage takes place from the uterus, the right heart may be somewhat relieved; but whether it is or not, a new danger must be faced presently. On account of the cessation of the placental circulation and the contraction of the uterus, a large quantity of blood is liberated and is forced into the veins. Under this new strain, the right heart may become so embarrassed that it may cease to contract and sudden death may occur.

What, then, is the danger of labor in a case of mitral stenosis? Evidently it lies in overdilatation of the right heart brought on by the frequent bearing-down pains of the second stage, and later by the blood from the uteroplacental vessels being suddenly poured into the engorged veins during the third stage.

And what is the remedy? Shortening the second stage, preventing or moderating the bearing-down pains by means of morphia, chloroform or ether and delivering artificially as quickly as possible. After the birth of the child, encouraging free bleeding from the uterus and if that does not relieve the cyanosis and strengthen the failing, shabby pulse, venesection (eight to sixteen ounces) will diminish the strain and tide the patient over the critical point of pressing danger. As bleeding from the uterus is to be encouraged, not checked, ergot should not be given and frictions to the fundus should not be used. After the urgent danger is over, perfect rest should be secured, by a small hypodermic of morphia if necessary, and the heart should be stimulated by hypodermic injections of strychnia and digitalin.

Mitral Insufficiency.—This is the commonest of the heart complications of pregnancy. In most of the cases there is good compensation and labor terminates safely, consequently this form of cardiac lesion is generally considered to be less dangerous than mitral stenosis or aortic disease. This hopeful view should not lead us to underestimate the danger, or to be less watchful and careful in the matter of treatment. When the insufficiency is great, especially if there is also tricuspid regurgitation, no form of heart disease is more desperate or has a gloomier outlook. When a woman with a damaged mitral is subjected to the strain

of rapidly recurring pregnancies, sudden and unexpected breakdown is apt to occur. She may have gone through two or three pregnancies safely and without any alarming symptoms, but each time it is becoming harder to get good compensation, until finally the limit is reached and the crash comes. In mitral insufficiency, the hypertrophied left ventricle throws the blood with great force back against the leaky valve, the left auricle dilates, the lungs become engorged and cough and hemoptysis are common symptoms. Unlike mitral stenosis, the symptoms of mitral insufficiency are not much relieved by the emptying of the uterus, for the left ventricle goes on pumping back the blood as before, keeping up the distension of the left auricle along with the consequent engorgement of the lungs and right heart. The bearing-down pains of the second stage increase the action of the left ventricle and intensify the symptoms. Cyanosis, passive pulmonary congestion, edema, and irregular pulse of low tension are the prominent features. These patients convalesce slowly and need careful watching and judicious treatment for weeks or months. Relief comes only from resting the heart and building up compensation. The patient may die in a few days, weeks or months after labor, generally as the result of some imprudence. The signs of danger during labor are an irregular, failing pulse, restlessness and dyspnea, along with increasing cyanosis.

What should be done in such cases? The first stage should be allowed to go on naturally, meanwhile securing free, watery movements and steadying the heart with digitalin. When the second stage begins, morphia, choroform or ether will relax the muscles, check or moderate the bearing-down pains, allow the vessels to dilate and the blood-pressure to fall and the strain on the right heart to moderate. Delivery should be effected as soon as possible by artificial means, free bleeding from the uterus should be promoted and hypodermic injections of strychnia and digitalin should be given as circumstances require. During convalescence, careful feeding, tonics and prolonged rest in bed are necessary. The patient should be warned against the danger of a future pregnancy.

Mitral stenosis and mitral insufficiency often coexist, and in such cases the symptoms of stenosis usually predominate, the prognosis is graver than when either lesion exists alone.

Aortic insufficiency is a comparatively rare complication of pregnancy. The infrequency of its occurrence is due to the

fact that the degenerative changes in the aorta and its valves which are the chief cause of this lesion do not usually occur until middle life or later when the child-bearing period is almost or wholly over. The danger is most marked after the fourth or fifth month when increase in the blood-mass and in blood-pressure aggravates the regurgitation and disturbs left ventricle compensation, even although hitherto it has been fairly well adjusted. The symptoms are edema, dyspnea, restlessness and insomnia. The second stage is disastrous; the bearing-down pains increase the blood-pressure, regurgitation becomes worse, the left ventricle must work harder to empty itself, and finally the end comes by syncope.

This is the form of heart disease which calls for prompt emptying of the uterus, no matter whether the child is viable or not, whenever symptoms of distress manifest themselves. Immediate interference is positively indicated when such symptoms appear early or persist in spite of rest and treatment.

Aortic stenosis is also rare, and is seldom found without the mitral valve being more or less involved also. It is remarkable how often aortic stenosis and mitral stenosis are found to coexist.

Treatment of Pregnancy Complicated with Heart Disease.—As soon as the lesion is discovered, treatment should begin. The patient should be kept under observation and efforts made to guard and maintain compensation. It is not wise to wait till a breakdown occurs, for it is much easier to prevent the loss of compensation than to restore it after it has been lost. Such patients should be kept from excitement, overexertion and fatigue; long walks, hill climbing, running up and down stairs, hot baths, alcoholic drinks, going to theaters and concerts or to meetings in overcrowded, ill ventilated halls may do serious damage. Gentle exercise and plenty of fresh air are helpful when the patient's condition will permit. The bowels should be kept free, not only for the purpose of relieving the circulation, but also to lessen the chances of toxemia developing. Upon the appearance of such symptoms as dyspnea, palpitation, a feeling of oppression, cough, hemoptysis or edema, the patient should be put to bed at once and kept absolutely at rest. An icebag or cold compresses over the heart may give relief when the pain is severe. Frequent dry cuppings, sinapisms or turpentine stupes are useful when there is lung engorgement with dyspnea and local pain. A small hypodermic of morphia acts

like a charm when dyspnea is urgent. Edema with quick, irregular pulse calls for digitalis.* The prolonged and free use of strychnia often enables us to tide the patient safely along to term, or at least to the period of the child's viability.

If the patient is seen early and compensation is good, if it is the first pregnancy, or if there is no exhaustion from rapid childbearing, she may be allowed to go on to term, the compensation meanwhile being closely watched. If the patient is not seen until the heart symptoms are marked, the first endeavor should be to build up compensation by absolute rest in bed, dieting etc. If that cannot be done, it will be best to induce labor as soon as the child is viable, in the thirty-fourth or thirty-fifth week; if possible; not earlier than the thirty-second, nor later than the thirty-sixth week.

If only moderate compensation exists and the patient is allowed to go on to term, the chances of failure are increased. Clinical experience goes to show that better results can be obtained in moderately severe cases by inducing labor when the child is small and can be delivered easily, than by allowing the patient to go on to term with the chances of a large child and a difficult forceps or version operation.

When the lesion is grave, the patient exhausted and there is reason to believe that compensation will not be maintained, it is better to end pregnancy, whether the child is viable or not.

When labor comes on, the first stage should be allowed to terminate naturally, unless urgent symptoms arise. A free bowel movement may be obtained and digitalin may be given freely to steady and strengthen the heart. If this stage is prolonged, nutrition must be maintained and rest and sleep secured. When the os is fully dilated, the uterus should be emptied artificially under light anesthesia of some kind. A hypodermic of morphia at the beginning of the second stage will soothe the pains, and then only a few whiffs of chloroform or ether will be required for the easy and rapid termination of labor. If the os is undilated and rapid delivery is necessary, artificial dilatation of the os or multiple incisions of the cervix should be employed. After the birth of the child free bleeding from

*It has been shown experimentally that digitalis is an irritant to unstriated muscle and may excite uterine action. Consequently it has been urged that digitalis should not be given to pregnant women with heart trouble, for fear of bringing on abortion. According to our experience no such complication need be feared with moderate doses of the drug, and we are in the habit of giving it as freely as we give strychnin when it is indicated.

the uterus should be encouraged. Ergot and frictions of the uterus do harm by checking the loss of blood which might relieve the overburdened right heart. If cyanosis persists and the venous pressure is not relieved, venesection will give the promptest results. Some recommend nitrite of amyl or nitroglycerin immediately after delivery when there is great dyspnea and extreme high tension. I have no experience of these drugs.

It is better to allow the placenta to separate naturally and to come away without artificial assistance. If the strain of delivery has not been recovered from, the extra strain consequent upon the artificial separation and extraction of the placenta may prove the last straw, and the patient may collapse suddenly (Case No. 1273).

To obviate the ill effects of the rapid fall of intraabdominal pressure after the conclusion of the second stage, it has been recommended to apply a firm binder, or to put a sand bag on the abdomen immediately after delivery.

The puerperium needs careful management. Strychnia, digitalin, morphia, laxatives, tonics and careful feeding should be used as circumstances require.

The child should not be nursed, even in mild cases; the mother needs all her strength and all the nourishment and rest she can get to enable her to recover from the effects of pregnancy and labor. Prolonged rest in bed during the puerperium is imperative until involution is complete and compensation has become well established. It should not be forgotten that the heart needs to involute as well as the uterus.

Whether or not it is prudent for a young woman with a pronounced valvular lesion to marry is a question sometimes submitted to the physician. In such a case the risks of marriage are always great, for the occurrence of pregnancy is certain to aggravate the disease and shorten life. It is best always to discountenance marriage under such circumstances. Whether our advice is followed or not, it is our duty to give the warning and that with no uncertain voice.

Analysis of the Series of Thirteen Hospital Cases.—These thirteen cases occurred in a total of 1022. Several have not been included in the list because the heart lesion was moderate, the compensation good, the delivery spontaneous and normal, no special symptoms arose and no special treatment was required. If we include these milder cases, the proportion of pregnant women with cardiac lesions who were delivered in the Montreal

Maternity would be about 2 per cent. Of these thirteen, there were:

I-gravidæ, 3
II-gravidæ, 4
III-gravidæ, 2
VII-gravidæ, 2
IX-gravida, 1
XIV-gravida, 1

There were:

Under thirty years of age, 8.

Thirty years and over, 5.

The youngest was twenty-one; the oldest, forty.

A definite history of cardiac lesions previous to this pregnancy 6.

Cardiac lesions arose probably during this pregnancy, 6.

Doubtful, 1

Labor at term,	8
Labor shortly before term,	2
Labor premature,	2
Undelivered,	1
	—
	13
Labor spontaneous,	4
Labor, induced and high forceps,	1
Forceps deliveries:	
mid, 1	
low, 3	
	—
	4
Version and extraction,	2
Extraction of breech,	1

Twins, 2 cases.

Anesthesia and narcosis during labor were used as follows:

Chloroform alone in	3 cases
Ether alone in	1 case
Morphia,	2 cases
Morphia and chloroform,	1 case
Morphia, chloroform and ether,	1 case
No anesthesia or narcosis,	4 cases

Results.—Mothers:

Discharged in fair or good condition 11 (1 undelivered).

Died, 2.

Children:

Born alive in 11 confinements out of 12, 12 (one case of twins).

Born dead in 1 confinement out of 12, 2 (twins).

If we exclude the two cases of myocarditis without valvular

lesion, the maternal mortality was one out of eleven (9.09 per cent.). In ten cases of valvular disease out of eleven, the mothers recovered and the children were born alive; in one case both mother and children (twins) died.

CASE NO. 859.—*Mitral stenosis with insufficiency.* Good compensation.

L. K., æt. twenty-five, II-gravida. Admitted, December 17, 1905; confined, December 17; discharged, December 30.

This patient entered the Maternity in labor, at term. From the first pain to the delivery of placenta, three and one-half hours. Labor spontaneous and rapid. Pulse after conclusion of third stage was ninety-six. Puerperium uneventful—discharged in good condition on the fourteenth day.

Clinical Note by Dr. Finley.—Slight choreic movements of face, hands and left foot. Cardiac impulse seen and felt near nipple, three and one-fourth inches from mid-sternal line. Marked presystolic thrill and strong, rather heaving impulse which extends up to third rib on left side. Marked diastolic shock at pulmonary cartilage. Dullness vertically to border of fourth rib; transversely from mid-sternal line, outward for three inches at fourth rib.

At apex, first sound replaced by systolic murmur; reduplication of second sound; systolic murmur transmitted into axilla and inward to lower end of sternum and upward to pulmonary cartilage. It is loud and blowing, best heard at apex.

At apex and just inside, there is an indistinct rumbling presystolic murmur, localized over a small area.

At aortic cartilage both sounds distinct; at pulmonary, faint systolic murmur and second sound enormously accentuated.

Pulse, low tension, normal volume, slightly collapsing, and slight capillary pulsation.

In neck is distinct pulsation in internal jugulars, more marked in left than in right. Liver and spleen not palpable.

CASE NO. 1405.—*Mitral stenosis with insufficiency.* Good compensation.

A. B., æt. thirty, II-gravida. Admitted, January 18, 1907; confined, January 25; discharged, February 7.

First pregnancy was normal, easy labor, good result for mother and child. In present pregnancy, general condition has been good, no dyspnea, can lie down without distress, some edema of left leg. Skin is pale; pulse small, regular and of fair tension; no capillary pulsation. Lungs clear; no precordial pain.

Apex beat visible in fifth interspace, five and one-fourth inches from mid-sternal line, palpable at same point, the impulse being forcible and fairly well localized. Cardiac dullness at level of fourth rib, extends transversely from right border of sternum to five inches to left of mid-sternal line.

At apex, both sounds are blurred; first sound replaced by loud, blowing systolic murmur, which is transmitted to axilla. There is

also a rough presystolic murmur, beginning right after second sound and leading up to the first. At the base, a soft, blowing systolic and diastolic murmur, heard best over pulmonary area, but also over aortic, P² sharp.

Labor at term was rapid. In one and one-half hours after the beginning of labor pains, the os was fully dilated. A hypodermic of morphia, gr. $\frac{1}{6}$, was given and the membranes were ruptured. The head descended slowly to the perineum, but in spite of strong pains, it was not expelled. As the pulse was growing very feeble, a hypodermic of strychnin, gr. $\frac{1}{30}$, was given, low forceps applied without anesthesia and the head easily delivered. Placenta separated in ten minutes and was pressed off. Another hypodermic of strychnin, gr. $\frac{1}{30}$, was then given. She was in good condition and made an uninterrupted recovery. Highest temperature was 98.8°. Child living and well.

A question might arise as to the significance of the basic diastolic murmur in this case. Such murmurs are so rarely functional that it is quite possible that the aortic orifice was involved as well as the mitral.

CASE NO. 2037.—*Mitral insufficiency*. Fair compensation.

C. G., æt twenty-one. I-gravida. Admitted, February 20, 1908; confined, March 18; discharged, April 1.

Patient has some edema, and more or less bronchitis at times. There is a moderate amount of albumin in the urine, with some casts.

Cardiac dullness did not extend beyond the nipple line. At the apex, a faint systolic murmur was heard, transmitted to the axilla. At times this murmur almost disappears; some days it is heard but faintly, other days very distinctly. At no time during pregnancy or while in hospital was there loss of compensation.

Labor.—First stage tedious; in second stage pains were regular and strong and advance was rapid. To moderate the severity of the pains, a little chloroform was given, to the obstetrical degree only. Suddenly toward the close of the second stage, the mask being over her face, she became extremely cyanosed, her breathing became rapid and shallow and then stopped altogether. Artificial respiration was begun at once and she gradually recovered. The placenta separated naturally and came away in fifty minutes; it was pale, firm and nearly half fibroid. The puerperium was uneventful. The highest temperature was 101.4°.

This case shows how suddenly dangerous symptoms may develop in the second stage. Misled by her good condition and the rapid course of her labor, it was thought that she might be allowed to deliver herself. Had forceps been applied early in the second stage, in all probability no difficulty would have been experienced. Her recovery was no doubt due mainly to the fact of her youth and her being a primipara.

CASE NO. 1272.—*Mitral insufficiency*. Fair compensation.

HEART DISEASE IN PREGNANCY, LABOR AND THE PUERPERIUM.

Case No.	Heart Lesion	Lesion began this preg.	Began before	Age	Gravida	Labor at or before term	Pregnancy	Labor	Puerperium
859	Mitral Stenosis with Insufficiency	?	?	25	II	Term	? Admitted in Labor.	Spontaneous and Rapid	Uneventful
1405	Mitral Stenosis with Insufficiency	+	-	30	II	Term	Slight Edema	Rapid—Low Forceps	Uneventful
2037	Mitral Insufficiency	+	-	21	I	Term	Alb. Casts, Bronchitis	Spont. Rapid Collapse	Uneventful
1272	Mitral Insufficiency	-	+	30	II	Term	Under observation throughout preg. for mitral lesion, alb. casts. Bronch.	Mid forceps	Uneventful
1273	Mitral Stenosis with Insufficiency	-	+	24	III	Prem.	Edema—dyspnea, cough	Version and Extraction—Twins	-
1290	Mitral Stenosis with Insufficiency	-	+	26	II	Term	Headache—Palpitation, dizziness, dyspnea	Low Forceps	Dyspnea, Cardiac Pain—Irrregular Pulse
1444	Mitral Stenosis with Insufficiency	-	+	35	VII	Term	Cyanosis, dyspnea cough, hemoptysis, edema general	Twins—Breech presentations, extraction	Uneventful, rapid recovery
1750	Aortic Stenosis	+	-	25	II	Term	Slight edema	Forceps failed—Version and Extraction	Irrregular, Intermittent Pulse for a few days
3010	Aortic Stenosis	+	-	40	VII	Near Term	Slight dyspnea, edema, cyanosis, poor compensation	Low Forceps	Uneventful
1458	Aortic Stenosis and Mitral Insufficiency	-	+	35	IX	Prem.	Edema, cyanosis, dyspnea, rapid breathing, palpitation, cough, hemoptysis	Induction of labor in 35th Week (Krause) High Forceps	Uneventful
1807	Acute Dilatation of Heart with Endocarditis involving Aortic and Mitral Valves, the latter prob. secondary	-	+	25	III	Before Term	Edema, dyspnea, pulm, edema	Spontaneous, very rapid	Dyspnea for a week—then good recovery
1719	Myocarditis acute	+	-	24	I	-	General weakness and abdominal pain after a fall. Dyspnea, frequent micturition—Headache	Undelivered	-
2095	Myocarditis chronic	-	Probably	40	XIV	Term	Alcoholism—occasional fainting fits	Retained Placenta, collapsed 15 minutes after birth of child	-

Abbreviations: M=Morphia.
 + = in 3d and 4th columns, the appearance of heart lesions; in columns of results, favorable for mother
 - in columns of results, death for mother and born dead for child

CASES TREATED IN THE MONTREAL MATERNITY.

Anesthesia	Compensation	Highest Temp.	Results		Subsequent History	Remarks
			Mother	Child		
None	Good	—	+	+		Admitted in labor. History hard to get and unsatisfactory.
M. gr. 1-6 Chlorof. (Obstet. degree)	Good	98.8°	+	+	Good Health	
	Mod.	101.4°	+	+	Good Health	Towards end of second stage, during chloroform, patient became suddenly cyanosed, breathing became bad and stopped. Artificial respiration restored breathing. Afterwards good and steady recovery.
Chlorof. (light)	Good	—	+	+	Good Health	Membs. were ruptured and forceps applied to head in cavity to save the strain of second stage. Made a good recovery; discharged on 18th day. No special treatment required for heart trouble.
M. gr. ½ Chlorof. (light)	Poor	—	—	{ — —	—	After 4 days' treatment in hospital felt so much better that she insisted upon going home; 3 days later she returned in labor, in desperate plight, having walked ½ mile, mostly up hill. Both children presented by breech; chloroform was necessary to permit the hand being passed through O. I. Death occurred suddenly after manual extraction of the placenta.
Chlorof. (light)	Mod.	99°	+	+	Feeling so much better she insisted upon going home on 11th day. A few months later, she died at home.	—
M. gr. ¼	Poor	99.6°	+	{ + +	In good condition a year afterward	Heart trouble began after her first confinement.
M. gr. ¼ Chlorof. Ether None	Fair	99.8°	+	+	A few months later was in good condition. Just recently aborted	Albuminuria, with plentiful granular casts.
	Poor	100°	+	+	No report	The history of previous pregnancies not satisfactory.
Ether	Poor	98.6°	+	+	Insisted upon going home on 14th day. Was then in fair condition. Thirteen days afterward was admitted to M. G. H. and died in 3 days of acute dilatation of heart	The heart trouble began 7 years ago and for 6 years she has been unable to do any hard work. Has been laid up several times with severe attacks, lasting 5 weeks. Her legs were never swollen till a few months ago. Was confined to bed for months before entering the Maternity.
None	Poor	101.°	+	+	Discharged much improved. Three months later entered W. G. H. Treated two weeks for chronic interstitial nephritis.	—
—	Much improved	—	+	?		Was discharged much improved in health. In a few weeks was so well that she was able to go home to the West Indies, where she would be confined.
None	Poor	—	—	+		Was an alcoholic, lived a hard, rough life—drinking freely. The child steadily lost weight, seemed incapable of digesting anything. It died on the 8th day, having lost 640 grams.

and born alive for child.

S. G., æt. twenty-six, I-gravida. Admitted, October 8, 1906; confined, October 8; discharged, October 25.

There was a history of rheumatism from early childhood, with frequent attacks of cardiac difficulty, loss of compensation, edema of legs, palpitation, etc. At the fourth month, she came under the care of Dr. Gordon, and then was found to have loss of compensation, with edema of legs, dyspnea, palpitation, hemoptysis, and signs of pulmonary infarction in the right base posteriorly. Under rest and treatment, all the symptoms disappeared except those of infarction, and she went along to term. On admission to hospital at the beginning of labor, it was found that the cardiac dullness extended transversely from the right sternal border to one-half inch beyond the nipple line, and a loud blowing systolic murmur was heard at apex, transmitted to axilla.

Labor pains began at 8 A. M. and were strong all morning: at 4 P.M. the pulse had become rapid and irregular, and as the os was fully dilated and the head well down, the membranes were ruptured artificially and forceps applied under light chloroform anesthesia. She stood the operation well and made a good recovery. A perineal tear, which was sutured unsuccessfully after labor, was repaired successfully six months later in hospital. She had at that time again signs of incompetence and pulmonary infarction, but she took ether well and made a good recovery. She is now living in New York and seems to be in good condition. During her stay in hospital on the two occasions it was not found necessary to give her any drug treatment for her cardiac trouble.

CASE No. 1273.—*Mitral stenosis with insufficiency.* Poor compensation.

R. R., æt. twenty-four, III-gravida. Admitted, October 8, 1906; discharged, October 12; readmitted in labor, October 15; confined October 15, and died.

The patient on admission was poorly nourished, cyanosed, with dry, glossy skin and difficulty in breathing. The lungs were clear and there was no cough. Pulse was rapid, small and compressible; venous pulsation in vessels of neck. There was no precordial bulging, no visible pulsation. A systolic thrill was felt over apex, heart enlarged to left, a systolic and presystolic murmur heard at apex. Systolic murmur was rough and transmitted to axilla. At base, P² was sharp and accentuated, no murmur. Abdomen very tense, liver and spleen not palpable; no ascites.

She said that she had always been strong and well and that her first pregnancy and labor were normal, that her second pregnancy was normal up to the end of the third month when she fell down some steps and aborted. After that she was ill in bed for a month, with pain over the precordia, a hacking cough and expectoration. Since then she has been very short of breath, especially on exertion, and finds it hard to walk upstairs.

Never had swelling of the legs until two months ago, since which time there has been marked edema of both legs.

The patient was kept quiet in bed on liquid diet, the urine was collected and examined, the bowels regulated, and hypodermics were given of strychnia, gr. $\frac{1}{30}$, bis in die and digitalin, gr. $\frac{1}{100}$, 4 q. h. She improved markedly and, on October 11, Dr. Finley made the following clinical note:

Patient has slight orthopnea, but can lie down for a few minutes. Respiration hurried, thirty-two per minute. Cardiac impulse rather feeble and diffuse, about four inches from mid-sternal line; a distinct fine thrill. The dullness at fourth rib is one inch to right and three inches to left of mid sternal line. At apex first sound is sharp and accentuated and preceded by a rough, rumbling, presystolic murmur; second sound absent. At base P² moderately accentuated with reduplication. Pulse 114, rather small and compressible. There is short cough, but lungs are normal.

Under rest and treatment, patient began to feel so much better that she insisted upon going home on October 12, in spite of our warnings and remonstrances. Three days later (October 15), she came back again in labor, having walked part of the way from her home, a distance of about half a mile and mostly uphill. Her pulse was small and rapid, she was gasping for breath, severe pains were coming every two minutes, and she was in a very serious condition. On examination the os was found to be nearly dilated, and a hand was presenting. A hypodermic of morph. sulph., gr. $\frac{1}{8}$, and one of strychnin, gr. $\frac{1}{30}$, were given. The membranes were then ruptured and a hand came down, but almost immediately another bag of membranes presented. When it, too, was ruptured, another hand appeared. When the operator tried to pass his hand into the uterus, so much resistance was offered by the cervix that it was found necessary to give a little chloroform. When at last the hand was passed into the uterus, the first child was found to be lying obliquely, and the second vertically presenting by the head. With some difficulty the children were, one after the other, turned and delivered, both being premature and dead. The patient was then in such poor condition that she had to be stimulated with strychnia and saline infusions. In half an hour she had rallied fairly well. The placenta could not be pressed off; so the hand was passed again into the vagina and one placenta which was completely detached was carefully removed by traction upon the cord; the other placenta had to be partially detached and then was easily delivered by traction upon the cord along with pressure from above. Almost immediately after the second placenta came away, the patient turned blue, gave a couple of gasps and died.

The following is the report of the autopsy held at the Royal Victoria Hospital by Dr. Klotz, pathologist to the Maternity:

Anatomical diagnosis:

Heart disease and pregnancy.

Chronic sclerotic mitral endocarditis.

Fibrosis of heart.
 Hypertrophy of heart (right side).
 Mitral stenosis with incompetence.
 Hydrothorax.
 Hydropericardium.
 Edema of lungs.
 Cloudy swelling and fatty degeneration of liver.
 Enlarged spleen (cardiac spleen?)
 Chronic interstitial nephritis.
 Hypertrophy (compensatory) of kidney.
 Puerperal state.

NOTE.—Death was due in this case to the condition of the mitral valve; its sudden appearance after delivery is likely a result of the sudden altered relation of the blood quantity to the vessels (combined, of course, with the extra strain of delivery).

The condition of the kidneys, an extreme grade of chronic interstitial nephritis with unilateral partial hypertrophy, is interesting.

CASE NO. 1290.—*Mitral stenosis with insufficiency.* Moderate compensation.

J. M., æt. twenty-six, II-gravida. Admitted, October 19, 1906; confined, October 19; discharged, October 30.

Patient was admitted in labor, at term, complaining of weakness, headache, dizziness, palpitation and dyspnea. There is a history of measles in childhood, but none of rheumatism or scarlatina. The first pregnancy, labor and puerperium seemed to have been normal. During the following summer she began to feel weak, short of breath on exertion, and had to rest when going upstairs. During the following winter she was fairly well, but when she became pregnant, the weakness increased, and as pregnancy went on she began to have the headache, palpitation and dyspnea more marked than before, increasing gradually till the present time. Always feels worse after eating; palpitation increases so much that she is afraid to eat and therefore takes but two meals a day. No precordial pain, no edema of legs.

Present condition.—Face flushed, skin and mucous membranes rather cyanosed, orthopnea well marked. Lungs clear, no cough or expectoration. Pulse small, compressible, eighty-eight per minute; no venous pulsation or capillary pulse.

Heart.—Visible pulsation in second left interspace none visible at apex. Marked systolic thrill palpable over whole precordia. Dullness vertically to second rib, transversely at level of fourth rib, two and one-half inches to right and four inches to left of mid-sternal line. At apex, first sound sharp, second sound faint. Loud, rough systolic murmur transmitted to axilla, and a blowing presystolic murmur, which is also heard at base. At base P² very loud, sharp and reduplicated; A¹ normal; A² clearly heard.

Patient was admitted about 10 A.M. in labor at term; at 1 P.M. the bag of membranes appeared at vulva. It was ruptured artificially, a few whiffs of chloroform were administered,

forceps applied and the child easily and quickly delivered. The pulse then became imperceptible at the wrist; hypodermics of strychnin, gr. $\frac{1}{30}$, and digitalin, $\frac{1}{100}$, were given. The placenta was allowed to separate and ultimately was carefully pressed off. Patient rallied well and passed a good night. The next day she had an attack of dyspnea with severe pain over heart and the pulse became rapid and irregular. She was given morphia, gr. $\frac{1}{8}$, and digitalin, gr. $\frac{1}{100}$, and a little later strychnin, gr. $\frac{1}{30}$, hypodermically. For a week digitalin and strychnin were kept up regularly, with an occasional injection of morphia to relieve dyspnea and precordial pain. At the end of a week, a few fine crepitant râles were heard over front of chest, but no dullness. Dr. Finley made the following note:

Pulse 60, regular, slightly diminished tension. Thrill slightly marked at apex; impulse strong and jet-like, felt four and one-half inches from mid-sternal line. Relative cardiac dullness vertically at third rib, transversely one inch to right and four and one-fourth inches to left of mid-sternal line at fourth rib. Well marked systolic and diastolic shock over second left space, best felt two and one-half inches from mid-sternal line, but also felt in third space. This impulse is also visible in second space. At apex, first sound loud and thumping, second sound not heard. A prolonged rumbling, presystolic murmur transmitted to posterior axillary line and inward toward lower end of sternum. At base P² enormously accentuated and also reduplicated. Soft systolic murmur heard in this region. Lungs clear.

The dullness diminished somewhat, the cyanosis disappeared and soon she was able to rest comfortably in a semirecumbent position. Feeling herself so much better, she insisted upon going home. A few months later she died at home, her heart troubles having been aggravated by want of care.

CASE NO. 1444.—*Mitral stenosis with insufficiency.* Poor compensation.

J. R., æt. 35, VII-gravida. Admitted, February 9, 1907; Confined, April 30; discharged, May 15.

Patient has had five living children and one miscarriage; the oldest child is ten, the youngest three years old. Previous labors normal. After first labor, she had inflammation of lungs and ever since has had heart trouble. During the four succeeding pregnancies, she felt well for the first four months, and then began to complain of weakness and cough with spitting of blood at times. She was treated for three weeks in the Royal Victoria Hospital for mitral endocarditis until compensation was fairly good. She left on January 6, but compensation was soon lost, and she was readmitted on January 20, suffering from severe dyspnea, cough and frequent hemoptysis. She was transferred to the Maternity on February 9. She was then markedly cyanosed, with visible pulsation of vessels of neck; there was dry, hacking cough, but no pain. Respiration not labored, twenty-four per minute; good expansion equal on both sides. Vocal fremitus normal. A

few coarse crepitant râles in the right supra and infraclavicular fossæ, and numerous fine crepitations over both bases. Pulse 120, of small volume and fair tension; no capillary pulse. Over precordia pulsation not visible, but quite palpable and diffuse. Apex beat palpable in fifth interspace, four and one-half inches from mid-sternal line. Over this area a fine systolic thrill is felt. Cardiac dullness, vertical at upper border of third rib; transverse from right border of sternum to four inches to left of mid-sternal line at level of fourth rib. At apex both sounds blurred, and a rough presystolic murmur transmitted upward to pulmonary area and axilla. Outside nipple line, both sounds sharp and distinct. Presystolic murmur lasts though systole. At base P^2 is accentuated.

A slight trace of albumin in urine, with some pus cells and urates.

Patient was kept in bed for upward of six weeks, and then allowed up for part of the day. Digitalis was given steadily for a month, then discontinued for a week and given again for another week; after that, only an occasional dose was required.

Labor.—First stage prolonged. Slight pains only. When os was fully dilated, a breech was found presenting with membranes intact. On account of the cardiac condition, it was thought best to deliver without anesthesia. A hypodermic of morphia, gr. $\frac{1}{4}$, was given and the membranes ruptured artificially. A hypodermic of digitalin, gr. $\frac{1}{100}$, was given and the child was easily extracted. A second sac was then found presenting; it was ruptured and the second child, also presenting by the breech, was easily extracted. Both children were alive and well developed (term). Patient's pulse was not much affected by the delivery. A hypodermic of strychnin, gr. $\frac{1}{30}$, was given as a precautionary measure, and the placenta was pressed off in ten minutes. During the puerperium, her condition improved markedly. She was up on the eleventh day and discharged on the fifteenth. She was seen a year after and was in good condition. Quite recently she entered the maternity again and aborted at the seventh month. She was discharged in good condition.

CASE NO. 1750.—*Aortic stenosis*. Fair compensation.

A. R., æt. 25, II-gravida. Admitted, August 9, 1907; confined, August 13; discharged, August 29. Slight generally contracted pelvis. Previous pregnancy, labor and puerperium normal.

A pale, delicate woman; lungs clear on percussion and auscultation. No visible pulsation over precordia. At apex is felt a very slight systolic thrill at times, no special shock. Over base is a very well defined long-drawn systolic thrill, but no special diastolic shock. Cardiac dullness vertically at second interspace; transversely one-half inch to right and four and one-fourth inches to left of mid-sternal line. Percussion note is impaired over manubrium. At apex, both sounds audible. First sound accompan-

ied by soft systolic murmur, which can be heard in axilla and over entire thorax, but becomes of maximum intensity as the aortic cartilage is reached; here it is very long in duration, extending up to second sound and has a distinctly rough, musical quality. Pulses, equal and synchronous, 72, regular, but small in volume and low in tension. Vessel wall not sclerosed. Neither liver nor spleen palpable; no edema of shins; albumin present, granular casts plentiful.

Pains were strong and severe. Labor was allowed to go on till onset of second stage, when the membranes were ruptured. Head was not engaged: a hypodermic of morphia, gr. $\frac{1}{3}$, was given and repeated. An attempt to apply forceps without anesthesia failed. Anesthesia was started with chloroform and soon changed to ether. The head was at the brim in L. O. A. Another fruitless attempt was made to deliver with forceps, then version was performed and delivery effected with some difficulty. The child was deeply asphyxiated, but respiration was finally established. Patient bore the operation well, the pulse not changing markedly in character. During the rest of the day the pulse was irregular and intermittent, ranging from 64 to 72. The irregularity continued for several days, the lowest rate recorded was 56. By the ninth day the range was from 70 to 85. Patient sat up with a headrest on the twelfth day, in a chair on the fourteenth, and went home on the seventeenth day. No special medicinal treatment was required. A few months later she was seen and was in good condition.

CASE NO. 3010.—*Aortic stenosis*. Poor compensation.

M. T., æt. VII-gravida. Admitted March 31, 1908; confined, April 6; discharged, April 20.

Patient has had five living children and one abortion. Pregnancies and labor normal; puerperium normal, except after first child, when she was ill for several months. She now complains of dyspnea, cyanosis and edema of legs.

Note by Dr. Howard: There is marked visible pulsation in neck, but no special fullness of superficial veins. Pulsation seems to be systolic and to originate in the carotids where a definite systolic thrill can be felt. Lungs clear on percussion and auscultation. There is fairly forcible impulse over entire precordia, being marked in second, third, fourth and fifth interspace. On palpation, a well-marked purring, prolonged systolic thrill is felt over whole precordia to right as far as the mid-clavicular line and to left to anterior axillary line, the point of maximum impulse being in second right interspace, where it is extremely superficial and occupies almost the entire cycle. There is no special shock. At apex both sounds are heard, although first sound is almost obliterated by a loud systolic murmur; second sound is loud and sharp. This systolic murmur can be traced into axilla and upward into body of the heart. At base P₂ is loud; over aortic cartilage the systolic murmur is of extreme intensity, rather high-pitched and almost sawing in character; it is very

long-drawn, occupying most of the cycle. It can be heard everywhere over both backs. Pulse is small, sustained and of fair pressure; the vessel wall cannot be felt.

Labor.—The first stage was slow and tedious, but patient showed no ill effects. The membranes were ruptured as soon as the os was fully dilated, and the head came down well. Low forceps applied and delivery effected easily. Second stage lasted ten minutes. No anesthesia. Placenta pressed off in twenty-five minutes. Puerperium uneventful. Discharged on fourteenth day.

CASE NO. 1458.—*Aortic stenosis with mitral insufficiency.* Poor compensation.

L. A., æt. thirty-five, IX-gravida. Admitted, February 20, 1907; confined, March 28; discharged, April 10.

Patient has had six living children and two miscarriages. Oldest child is now fifteen, the youngest six years old; last miscarriage was in 1905 at three months. In previous pregnancies she suffered much from vomiting; labors were normal, the puerperium also; was always able to resume household duties soon afterward. Last menstruation began July 1, 1906. She entered the Royal Victoria Hospital on February 5, 1907, complaining of swelling of feet, palpitation and a sensation of smothering and choking. She was transferred to the Maternity on February 20.

Palpitation and breathlessness were first noticed seven years ago and lasted five months (three at home, two in the hospital). A year subsequently she was confined in the Maternity. Since then she has not been able to do any hard work. Had a severe attack three years ago and was again confined to bed for five months (at home). After that attack she was able to be about until last November when she took to bed and has not been up since, being troubled a good deal with cough and hemoptysis.

The legs were never swollen until this last attack.

She is poorly nourished; the skin and mucous membranes pale, with a cyanotic tinge. She assumes the orthopneic position; breathing is quiet: there is distressing cough, with blood-tinged expectoration; the lungs are clear.

There is pain over the precordia. Pulse, 100, soft, collapsing, of small volume and low tension. No capillary or venous pulse. The vessels are somewhat thickened. Diffuse pulsation is palpable over precordia. Apex beat is palpable in sixth interspace four and one-half inches from mid-sternal line. A distinct systolic shock is felt at apex with a fine systolic thrill when patient sits up. Slight diastolic shock best felt over pulmonary area. Vertical dullness at second intercostal space: transverse four and three-fourth inches to left and one and one-fourth inches to right of mid-sternal line, at level of fourth rib. At apex, first sound is sharp, second sound accentuated, with loud, blowing systolic murmur transmitted to axilla. At base both sounds are accentuated; pulmonary very sharp. Over both pulmonary and aortic areas is

heard a rough, systolic murmur, most distinctly over pulmonary. Over third left costal cartilage there is a soft, blowing systolic murmur transmitted up and down the sternum. No ascites.

It was decided to induce labor as soon as the child was fairly viable. A bougie was inserted at 3 P.M. on March 27. Next morning the pains were strong and regular; at 4 P.M. the os was fully dilated. The membranes were then ruptured. A few whiffs of chloroform were given, forceps applied to the head at the brim and a living child easily extracted. The placenta separated in six minutes and was easily pressed off. A hypodermic of strychnin, gr. $\frac{1}{30}$, was then given. The puerperium was uneventful and both mother and child were discharged in fair condition on the fourteenth day. No special treatment was given for the heart condition, other than rest in bed, careful dieting and attention to the functions of bowels, kidneys and skin.

Contrary to advice, she insisted upon going home on the fourteenth day (April 10th). She was admitted to the M. G. Hospital on April 23, and died there on the twenty-sixth of acute dilatation of the heart.

CASE NO. 1807.—*Acute dilatation and hypertrophy of heart with endocarditis involving both aortic and mitral orifices. Mitral probably secondary.* Poor compensation.

K. D., æt. twenty-five, III-gravida. Admitted, September 11, 1907; confined, September 12; discharged, September 30.

Patient was married July 4, 1902, and has had two living children, the elder is now three and one-half and the younger one year old. Both times pregnancy, labor and puerperium were normal.

Clinical Note by Dr. Hamilton.—Patient very anemic, no dyspnea, lies comfortably in bed.

Pulse fairly full. Slightly collapsing. Very faint capillary pulse in fingers. Right radial fuller than left; carotid pulsation seen in neck. There is no definite venous overfilling, but along line of internal jugular veins is seen a diffuse wave; external jugulars negative.

Heart.—Inspection difficult on account of size of breasts. Diffuse impulse is felt over precordia. Slight pulsation of sternum. Over aortic area, there is a suggestion of a systolic thrill. No palpable accentuated sound. Marked sensitiveness over sternum.

Deep percussion is forbidden by pain, but the following is on record: deep dullness six and three-fourths inches transversely from a point one and one-fourth inches to right of M. S. L.

At apex, first sound weak, accompanied by a systolic murmur; second sound somewhat sharp.

Pulmonary Area.—P¹ weak, accompanied by a very similar systolic murmur; P² accentuated.

Aortic Area.—A² sharp, very comparable to P². Systolic murmur.

Tricuspid Area.—Systolic murmur, maximum intensity at second left space. The same murmur heard well at first right space and at first right I. C. C., but not quite so loud here. The murmur is heard in vessels of both sides of neck; second sound is also audible here. In left axilla systolic murmur is faintly audible. On auscultating from left axilla over apex to pulmonary area this murmur is heard with increasing loudness. No diastolic murmur is heard, the second sound being clear-cut and not followed by diastolic murmur.

Diagnosis.—Acute dilatation and hypertrophy of heart. Endocarditis involving both aortic and mitral orifices—the mitral involvement being likely secondary.

Labor began at 4 A.M. and was very rapid. Pains came on suddenly and forcibly; the membranes soon ruptured (5.15 A.M.), the head descended rapidly and emerged transversely, occiput to right; one coil of cord about neck (5.25 A.M.). Placenta detached in ten minutes and came away spontaneously. On the second day postpartum, patient complained of great difficulty in breathing. The distress and smothering were relieved by hypodermic of morphia, gr. $\frac{1}{4}$, and sleep was secured. Morphia was continued daily for a week. When discharged (September 30), she was found to have improved markedly since admission: the edema and dyspnea have disappeared, the heart is somewhat smaller in size and the sounds are clearer.

On December 26, she was admitted to the M. G. Hospital with chronic interstitial nephritis and was discharged improved in two weeks.

CASE NO. 1719.—*Myocarditis, acute.*

E. P., æt. twenty-four, V-grávida. Admitted, July 21, 1907; discharged, August 23, undelivered.

Patient is a dressmaker; entered hospital on account of general weakness and pain in back and abdomen. She has had four living children and one miscarriage; the eldest child is now seven; the youngest nearly two years of age. There is nothing special in the history of previous pregnancies. There is no history of rheumatism, chorea or alcoholism and she seems to have been a very healthy woman. When she came to Montreal, about two months ago, she was in good health, but a month later she fell downstairs and hurt her back. For a few days she suffered from distressing frontal headache and from frequent micturition (especially at night.) She continued working for a couple of days after the fall, but fainted twice and had to stop on account of great general weakness and breathlessness on the least exertion. When lying in bed there is no dyspnea and no cyanosis. Lungs clear on percussion and auscultation.

Heart.—Rather forcible impulse, especially in nipple-line. Vessels of neck pulsating. Cardiac impulse not forcible on palpation, no thrill; point of maximum intensity in fifth left inter-space 11 cm. from mid-sternal line. Cardiac dullness, vertical

at third rib; transverse 2 cm. to right and 11 cm. to left of mid-sternal line at level of fourth rib.

Apex.—Heart-sounds irregular, due to occasional reduplication of second sound. A soft systolic murmur of varying intensity, transmitted to axilla. Second sound audible at apex, rather short.

Tricuspid.—Systolic murmur louder, becoming still louder on being followed up sternum. Maximum intensity in third left interspace.

Base.— P^2 accentuated; A^2 sounds valvular in quality. The irregularity due to reduplication of second sound is best heard at base and is heard every third to fourth beat.

Pulse 72, small in volume and tension, irregular in force and rhythm.

Patient was kept quiet in bed, a hypodermic of morphia, gr. $\frac{1}{3}$, given 4 q. h. for a few days and an ice bag put over the precordia. When the symptoms were relieved. Pil Blaud was given and improvement was rapid. She sat up in a chair for two hours on August 11, and was discharged in good condition August 23, promising to return at the time of confinement. However, two months later, she had to go home to West Indies, but was feeling well and quite able to undertake the journey.

CASE No. 2095.—*Myocarditis chronic*.

S. McH., æt. forty, XIV-gravida. Admitted, March 13, 1908; discharged, March 16; readmitted, March 22; confined and died, March 24.

No history could be got of trouble in previous pregnancies, except that there was an adherent placenta after the last labor. Patient showed some signs of mental disturbance and was evidently somewhat under the influence of liquor. Subsequently she gave a history of chronic alcoholism and of occasional fainting fits during this pregnancy. As the pains had entirely disappeared and there were no signs of labor, at her own urgent request she was allowed to go home on March 16. She returned on the 22d with pains coming at long intervals. Temperature normal; pulse, 120, irregular in rhythm, no murmurs, no enlargement of heart on percussion. Urine showed a faint trace of albumin, no casts. Fetal heart-beat, 160 to 180. Complained of nothing besides occasional labor pains. Definite pains set in March 24, at 7 A. M., but soon disappeared; they began again between 12 and 1 P. M., the membranes ruptured spontaneously at 1.15. The maternal pulse was then 118, fetal heart, 162. The second stage was short, four or five pains in all, and a living child was born; no anesthesia was used. After the birth of the child, the mother's condition seemed good and the pulse fell to 96. But the uterus did not contract well and considerable blood came away. About fifteen minutes after birth of child, the patient blanched suddenly and the pulse became weak. A hypodermic of strychnin, gr. $\frac{1}{30}$, was given, but as there was no response, a hypodermic of camphor oil,

m.v. (camphor, gr. i) was administered and she rallied a little. Next, a submammary infusion of 600 c.c. normal saline solution was given and she seemed to get much better. As the placenta had not come away in three-fourths of an hour and there was still a little trickle of blood, it was decided to remove the placenta manually. It was found to be closely adherent along the right side of the uterus and in the right cornu. After the removal of the placenta another hypodermic of strychnia, gr. $\frac{1}{30}$, was given, and as her condition did not improve another hypodermic of camphor oil, m.v., was administered. The condition, however, grew rapidly worse. Artificial respiration was tried, but in spite of all efforts she sank and died at 3.05 P.M.

At the autopsy, the following anatomical diagnosis was made:

Chronic myocarditis; chronic nephritis; chronic pleuritis; chronic endometritis; pulmonary edema. The child (full-term) weighed at birth 3055 grams, but lost weight steadily and died on the eighth day, weight 2415 grams. It was nursed for a time by a patient in the ward whose child was thriving well, and then, when it became weaker, breast milk was pumped out and fed to it; whey mixture and modified milk were tried, but it seemed to be unable to digest anything.

605 DORCHESTER STREET, W.

DISEASES AND INJURIES OF THE CERVIX UTERI.*

BY

P. F. CHAMBERS, M. D.

THE more spectacular work upon the other structures within the female pelvis during the last twenty years has so absorbed the attention of the medical profession that a paper upon the diseases and injuries of the cervix uteri may appear at first thought as a step backward or as a glimpse into former gynecology. At the same time, there is no organ the treatment of which should more properly come up for discussion before this, an obstetrical and gynecological society.

Situated as it is, concealed and protected by nature, it is subjected to more traumatism and infection, and I might also say more surgically abused than any other structure of the body.

It is merely a sphincter guarding the uterine cavity. It is sparsely supplied with lymphatics so that its inflammations are rarely transmitted to the surrounding tissues. On the other hand, it participates in most of the inflammatory troubles of the body by either direct extension or on account of the acrid

* Read before the New York Obstetrical Society, May 12, 1908.

discharges over its mucous membrane. Its comparative freedom from nerve-supply, while a blessing to the woman during parturition, is, nevertheless, a cause of its insensibility to injury. As a consequence, the injury may go undiscovered for years or until attention is attracted to it by other resulting serious conditions. For similar reasons, infection may lurk dormant in the mucous follicles for months, only to be awakened by some subsequent event, such as parturition or traumatism. This explains a sudden attack of vaginitis or severe endometritis and salpingitis following parturition months after exposure to a gonorrhoea.

There are rarely, if ever, any acute constitutional symptoms, such as chills, fever or malaise, associated with cervical inflammations, but they are usually attended with a dull, heavy or dragging feeling in the pelvis, and with uncomfortable or burning sensations in the vagina. The general health is somewhat impaired, but the reflex nervous symptoms are varied and numerous. Among these may be mentioned backache, headache, a capricious appetite, poor digestion, constipation and emotional hysteria. All inflammations of the cervical glands are attended with a secretion varying in character from thin serum to thick mucus, sometimes streaked with blood. Often it is profuse in quantity and so tenacious that it can be neither wiped nor washed away and can be removed only by the curette or suction syringe.

When the outlet of a cervical gland is occluded, the gland becomes distended and often protrudes, then forming what is known as a glandular polypus, but ordinarily the pent-up secretions distend the glands throughout the interstitial tissue, producing what is known as cystic degeneration, the most common and remotely the most dangerous of all inflammatory diseases of the cervix, owing to their tendency to undergo an epitheliomatous change.

If the cysts thus formed are few in number, they can readily be treated by simple puncture and the application of carbolic acid to their lining. If they are numerous, the entire cervix should be thoroughly curetted with a sharp curette, or longitudinal incisions should be made down to the bottom of the cysts, followed by repeated applications of equal parts of carbolic acid and tincture of iodine, associated with the use of wool tampons saturated with borosalicylate of glycerin.

Glandular polypi can be easily removed by torsion or excision

with scissors without a local anesthetic. Care should be taken to see that all bleeding has ceased before the patient is allowed to leave the table, especially when this operation is performed elsewhere than in a hospital. I have frequently known severe hemorrhage to follow the removal of a small polypus—a serious sequela for both patient and physician.

Frequently, when there is inflammation of the glands with no stenosis of their ducts or when the discharge from the uterine cavity is of an ichorous character, there is an exfoliation of the epithelium of the cervix, producing an ulcerated appearance. This condition was formerly called ulcer of the cervix. The surface is not depressed by loss of tissue, however, but is really elevated. The condition is a granular erosion and is properly treated by attacking the cause rather than the eroded area.

If it is due to a uterine discharge, treat first the endometritis; treat the cervical glands if they are at fault; remove a pessary if it offends.

If an inflammation of the cervix is due to a septic, especially a gonorrheal infection, an attempt should be made at once to check its advance and to prevent, if possible, an invasion of the deep-seated tissues. The canal should be thoroughly cleansed of all discharge and applications of a 50 per cent. solution of argyrol should be made daily up to and just through the internal os, followed by tampons of borosalicylate of glycerin. These tampons should be removed six hours later and a vaginal douche of four quarts of hot, 1-10,000 bichlorid solution given. As the acute inflammatory symptoms subside, the applications and douches should be given at longer intervals, but should not be discontinued until all symptoms have disappeared and smears show no gonococci.

Cervical hypertrophy may simulate prolapse of the uterus. Upon bimanual palpation, however, the fundus is found to be, as a rule, higher than normal, due to its being pushed up by the large cervix, instead of being in a condition of prolapse.

In amputating a hypertrophied cervix care should be exercised to avoid wounding the bladder, as its wall is often involved. A sound inserted in the bladder and the finger in the rectum are necessary guides when performing this operation.

Cervical stenosis, although occasionally a congenital lesion, is much more frequently a result of a surgical operation or the application of caustics. The canal may be so contracted as to form a complete atresia, causing in time a hematoma of men-

strual blood. The condition is possibly relieved by a bilateral incision, but sometimes it is very difficult to cure. It may necessitate a long course of treatment, owing to the tendency of the cicatricial tissue to contract. Repeated dilatation and the use of a glass-stem pessary may be necessary.

If the stenosis is of an inflammatory character, the cure of the inflammation by incision and applications as in the treatment of cystic degeneration will readily relieve the trouble.

I do not think it ever advisable to use gauze packing in the treatment of any of the diseases of the cervix. The gauze soon becomes stiff and hard and, instead of assisting, prevents drainage. The natural position and structure of the canal permits free drainage. When a necessity exists that the canal should be kept open, it can be more effectively done by the glass-stem pessary than by gauze.

The above remarks refer only to the acquired stenoses. A congenital atresia belongs more properly under the head of malformations and consequently is not considered in this paper.

Secondary tubercular disease of the cervix is very common, but a primary involvement is rare, only a few cases being reported. The question of an operation for this condition depends, of course, on the extent to which tuberculosis is present elsewhere in the body. At times no operation is advisable; at other times a high amputation of the cervix or a hysterectomy should be done.

Of the malignant diseases of the cervix, epithelioma, carcinoma and sarcoma are all of frequent occurrence and may attack the cervix primarily or secondarily. In the case of carcinoma and sarcoma a hysterectomy alone is advisable—a procedure, the description of which is not within the scope of this paper. If the tumor is an epithelioma, fortunately the most common form, a high amputation of the cervix may be all that is required. In this case, care should be observed that the circular incision includes a strip of vaginal tissue all around the cervix, and the dissection should be carried well up to and even slightly above the internal os. The other words, be careful to remove all of the cervical tissue. Should there be the slightest question of the tumor having extended higher up, of course the entire uterus should be removed, but my experience has been that a high amputation accomplishes everything that an extirpation could. If there is a return of the disease, it is much more apt to be in the vaginal wall than in the remaining portion of the uterus.

Owing to the fear that cystic degeneration of the cervix—a condition very common after lacerations of the cervix—may undergo an epitheliomatous change, there is a disposition on the part of many surgeons to amputate all cases of lacerated cervix, instead of performing the operation of trachelorrhaphy, or repair of the cervix. I doubt whether many women ever bear a child without having a laceration of more or less extent, and while a score of years ago the pendulum swung too far in the direction of only repairing the lacerations, I think that, during the last few years, the trend has been too far in the other direction.

In many cases where amputations of the cervix are performed, and often because they are easier to do, the operation of trachelorrhaphy would, in my judgment, have been a much better surgical performance.

The operation of trachelorrhaphy as perfected and taught by Emmet restores the cervix to its normal cone shape, the lining of its canal is inverted and relieved of the former constant exposure to infection and traumatism, the tendency to cysts quickly disappears and the muscles of the cervix regain their tone and are prepared to fulfill their function in the next pregnancy. Emmet's operation should be thoroughly performed, the denudation accurately and carefully made, and the sutures passed at right angles to the cervical canal and not antero-posteriorly as is so frequently done.

In closing this paper, I feel that an apology is due for its fragmentary character, but the subject is so large and the time for its presentation is so short, that I felt that the few personal views given would prove to be the most acceptable to this society.

49 W. FIFTY-SEVENTH ST.

GANGRENE OF THE PUERPERAL UTERUS.*

BY

A. J. RONGINSKY, M. D.,

New York.

Instructor in Diseases of Women, Postgraduate Medical School, Adjunct Gynecologist
Lebanon Hospital.

THIS condition is very rare, particularly where the gangrenous process involves the endometrium and muscular coats of the whole uterus. Standard text-books on obstetrics and gynecology

* Read before the Eastern Medical Society, May 8, 1908.

make no mention of it, and in the literature very few cases are reported. The following case is therefore of interest:

Mrs. M. H., forty-four years of age, born in Germany, housewife, was admitted to the Lebanon Hospital to the service of Dr. Ralph Waldo, March 26, 1907, with the following history:

Family History.—Mother died two weeks after confinement, father alive and well; no history of cancer, tuberculosis or diabetes in the family. Four years ago patient underwent an abdominal operation for prolapse of the uterus, otherwise she had not suffered from any injury or disease. She began to menstruate at fourteen, and has always been regular, every four weeks the flow lasting five days, and being moderate in amount and painless. Her last regular period occurred on December 20, 1906.

Obstetrical History.—Had one child twenty years ago at full term; labor was instrumental. Second child was born at seven months, eighteen years ago. Patient remained in bed for ten days after labor. She had three abortions previous to the present one, spontaneous in occurrence and not followed by fever.

Present history dates back to two weeks before admission when patient began to flow. This continued until admission. It came on spontaneously and was not accompanied by any pain until the night before, when the patient commenced to have pain in the back, bearing down in character, which lasted for several hours. During these two weeks, although the patient did not take to bed she could not attend to her usual household duties. She felt as though her womb was falling out. On admission the fetus was found in the vagina, one hand protruding through the vulva. It was removed. The placenta was not expelled at first, but came away after a douche. Both fetus and placenta were entire, but very foul and gangrenous. Patient was taken to the operating-room and on examination it was found that the cervix was fully dilated, the endometrium hanging in foul black shreds, the uterus enlarged to the size of the third month of pregnancy. The patient was not curetted. There was a small red spot on the left side of the crest of the ilium about four inches from the anterior superior spine; this spot has enlarged and others have appeared. Temperature was 98°, pulse eighty-eight, respiration twenty-four.

Physical Examination.—Patient lies on her side; is conscious and rational, well nourished, muscles firm. Skin of face is flushed but there are spots of vesicles, many of these are confluent. Pupils are small, equal and react to light and accommodation. Tongue dry and fissured. Mouth and pharynx are dry and brown, Uvula is stuck to the hard palate. Tonsillar recesses very distinct, tonsils shrunken. Heart sounds are distinct and regular, no murmurs heard. The heart is not enlarged. Pulse full, strong, regular, of moderate tension, vessels not thickened. Lungs negative. Abdomen distended and shows general rigidity. No masses palpable. Liver and spleen could not be felt.

Over the lower end of the sacrum there is a large angry red patch about four inches square, the deepest congestion being in the center; there are other patches on the buttocks between the spine and axillary line on the left side; two are over the crest of the ilium. Numerous fine white elevations can be seen upon these red bases, also some dark red and black spots some of which are flat, others elevated and fluctuating. The borders of these congested areas are indistinct, no crusts present.

March 27, temperature normal, pulse 120. Vaginal discharge very offensive. On examination, the cervix appeared like a dark spongy mass and on exploration of the uterine cavity with a sound the same spongy condition could be felt. A section for pathological examination and cultures of the discharges were taken. Patient commenced to vomit large quantities of fluid. Blood examination showed hemoglobin 90 per cent., white cells 32,400.

March 28, temperature, 97°; pulse, 100. Patient slept the greater part of night. Appeared brighter; voided urine involuntarily. Vaginal discharge still very offensive and of foul odor.

March 29, condition about the same.

March 30, general condition grew worse. Developed ill-looking sores of lips and mouth, vomiting continued; temperature 103°, pulse 120, respiration 26. Cultures taken from cervix showed pure growth of gonococci. Blood examination showed hemoglobin 80 per cent., white cells 15,800. Urine showed traces of albumin, no casts, a few pus cells, specific gravity 1017.

March 31, general condition very bad, at times delirious. Temperature, 98 to 99½°; pulse, 98 to 120. Had no control of the sphincters.

Pathological Report.—Culture from cervix on agar-agar broth and blood serum showed a mixed infection of gonococci, staphylococci and streptococci. Culture from blood on above media showed no growth, blood smear showed some pallor of red cells; red cells, otherwise, normal; white cells increased in number, relative increase of polymorphs. Differential leukocyte count showed polymorphs 89 per cent., small lymphocytes 5 per cent., large mononuclears and transitional 6 per cent., white cells, 16,800; hemoglobin, 80 per cent.

Patient's condition grew worse. She did not respond to stimulation. Operative interference was not deemed advisable on account of profound shock that patient was in. She died April 5, at four A. M. An autopsy was performed the same day and the pathologist's report of the uterus was as follows: Section of the uterus of Mrs. H. shows marked desquamation, degeneration and necrosis of the mucous membrane. There is an infiltration of round cells between the muscle bundles, with consequent degeneration and necrosis of muscle-cells, a similar infiltration between the muscular and mucous layers of the uterus. The muscle-fibers also show fragmentation and necrosis. The blood-vessels are all filled with thrombi. Inflammation about the

vessels is marked, as shown by degeneration of cells. The glands of the uterus take part in the same process.

Diagnosis.—Gangrene of uterus involving the mucus and muscular layers.

The only similar case recently reported is that of Schmidlechner of Tauffer's clinic of Buda-Pest, this being the only case among thousands seen in the course of twenty-three years, and in that case the cervix and the lower third of the uterus was only involved, the posterior wall being slightly involved, while in this patient the whole uterus was involved. As to the etiology, I believe that the mechanical pressure which took place in the uterine cavity as it was trying to empty itself during the past two weeks accompanied by the severe gonorrheal infection which caused a lesser resistance of the tissues, produced an obliteration of the peripheral blood-vessels, which in turn caused the moist gangrene found in this patient.

154 HENRY STREET.

MOLLUSCUM CONTAGIOSUM OF THE GENITALS
IN HUSBAND AND WIFE AND OF THE FACE
AND NECK IN THEIR INFANT BOY.

BY

J. R. GOODALL B. A., M. D.

McGill University and Royal Victoria Hospital, Montreal.

MRS. C., aged twenty-three, a Parisian, who had immigrated into Canada immediately after her marriage, came to me in March, 1904, to engage me to attend her during her confinement.

She was then about five months pregnant and complained of frequency of micturition by day, but not by night. I made a thorough pelvic examination and found her in a perfect state of health, and the pelvic measurements indicated a roomy, normal pelvis. The urine also being free from any abnormal products, I put the condition down to vesical irritability. The symptoms passed off completely during the late stages of the pregnancy.

Two months after her first visit, her husband consulted me about a genital trouble. He stated that about three months ago he noticed a small "wart" on the dorsum of the penis, and that since then several others had developed, and that he could not account for the "trouble."

He had been in Canada as chef in a very large hotel, and had emigrated from France about June, 1902. He crossed to Paris again to get married and bring his wife with him to Canada. He had been settled in his new home about three and one-half months

when the first "wart" appeared. He said the only explanation of the origin of infection could be found in the fact that he, when on board ship, crossing to France, frequently had to use the same towels as were used by other men.

In an endeavor to overcome the disease, he had cauterized the first one that had appeared with caustic silver, and since then it had become inflamed, tender, and by friction with his clothing caused him considerable distress.

Upon examination I found eleven mollusca on the dorsum of the penis. The largest and the first to appear was on the free outer surface of the prepuce, about one-half inch behind the free margin. It was about three-eighths inch in diameter, its surface black from silver and raised considerably above the surrounding skin surface. The outer margin was surrounded by a narrow but distinct zone of inflammation. Upon raising this crust or indurated surface, a small quantity of pus spurted, evidently under considerable pressure, and left a cup-shaped cavity with a perfectly smooth base. Morris and Crocker refer to this spontaneous mode of cure, which in this case was probably assisted by the action of the silver.

The ten other mollusca lay in two rows down the dorsum of the penis, as if it might have been a lymphatic extension, which, of course, is not the recognized method of propagation, though the regularity of arrangement was, to say the least, suggestive. These presented the two typical varieties of mollusca: the low and the polyoidal form.

The low ones which constituted the great majority (seven) were all of the same general form, though each succeeding one grew smaller as one approached the root of the penis, showing distinctly that they were all of unequal age and had arisen one after another from a common source of infection, namely, the first one to appear, or that each one as it developed infected a follicle in its neighborhood and gave rise to a new growth. I cannot lay too much emphasis upon the symmetry of the growths in two parallel lines, and the manner in which they so gradually grew smaller the farther one receded from the prepuce. These two, especially the latter fact, speaks for a possible slow lymphatic extension.

The low type, variable in size, rose in a mamma-shaped elevation, with a central umbilication from which the characteristic white secretion could readily be expressed.

The mollusca were pearly white and the neighboring tissue free

from inflammation. The acuminate type grew, as a rule, as an oval mass about the size of a very small pea upon a stem of variable dimensions.

The umbilication in these, though not so apparent, could be readily found and it invariably yielded the secretion.

Under cauterization, after expression of contents, the condition quickly healed. But about two weeks later two very small mollusca appeared upon the squamous surface of the prepuce.

I immediately warned him against sexual relations, owing to the contagiousness; and especially owing to the fact that the wife was pregnant, which by its congestive influence upon the vulva would render her more liable to the disease.

This advice he swears he heeded. He brought his wife with him at his second visit and under a most careful examination of external and internal genitals not a trace of the disease could be found.

She was delivered of her child on July 14, 1904. At that time not a sign of the disease was detectable, and I did not see the patient again after she had recovered completely from her confinement until two months later. She then came to consultation, stating that she thought that she had contracted the same disease that her husband had had. Her nurse had told her that there was a small pearl-like body on the left labium majus when she had last seen her, which was on the sixteenth day after delivery. Of this she had said nothing to me, though I had seen her several times after that date.

Upon examination, nineteen mollusca were found over the genitals. They were confined to the labia majora, outer surface of minora, perineum and region of the anus. They were chiefly on the left side. Both varieties were present, and while under treatment three small ones appeared on the inner side of the left thigh. They yielded slowly to treatment. At no time, even under the most careful examination, could any trace of the disease be found either on the cervix and vagina or on the mucous surfaces of the vulva, showing that the bactericidal action of the genital secretion prevented infection, even though the distal end of the penis was the part first affected and even though these surfaces were congested and softened by the pregnancy. Another reason which may be advanced is the absence of glands, sebaceous or other, in the vagina, but this argument does not hold for the inner surfaces of the labia minora and vestibule.

Just eleven months later the mother brought her child, which had developed seven mollusca upon the left side of the neck and shoulder. These again were typical and of both varieties. They yielded readily to treatment.

These three cases, apart from being interesting owing to the extreme rarity of genital molluscum contagiosum, of which none of the books on genital diseases nor those on skin diseases make mention, present several features which may throw some light upon the characters of this rather rare disease.

Undoubtedly the husband first contracted the disease from some unknown source and through marital relations communicated the disease to his wife, and the most likely means of infection of the child was, I think, through the contact of the soft delicate skin of the child's neck with the left side of the vulva where the first vulvar molluscum appeared.

It was an L. O. A. delivery and I had had a great deal of trouble in delivering the shoulders of the robust child, for they had not rotated, but had "blocked" in the transverse. Doubtless the mother was infected a long time before her labor, but the disease did not appear on the vulva until sixteen days after labor and, if the statements of the husband are reliable, no marital relations were indulged in after I had advised him.

From this it follows that the period of incubation in the woman must have been of at least five months' duration, and probably a great deal longer, and if the child's neck was infected at the time of labor then the incubation period in its case must have been eleven months. But as these had been present on the child's neck for some little while—the mother said about six weeks—before she consulted me, we must assume that from the time of infection to the time of the appearance of the first signs at least nine and a half months can intervene.

I have already referred to the freedom from infection of vagina and portions of the vulva moistened with secretion, which fact is quite in keeping with bacteriological teaching.

Another feature of this case, which has but little bearing upon the present paper, is that the mother did not develop the disease about the breasts as is so frequently the case when a child infected with molluscum nurses or lies against the maternal mamma.

The patient nursed her child as long as she remained lying on her back, but as soon as she stood up she could no longer do so. It would seem that the milk-ducts were completely devoid of any

sphincter muscle whereby the secretion could be stored up. The very copious milk secretion ran from the breasts as rapidly as it was secreted, leaving the glands quite empty so that the child was starving owing to the small quantity that it got at each nursing, and the mother had to change her linen many times a day, for the quantity that was secreted seemed enormous.

Every means to store up the secretion failed, except the expedient of keeping the patient on her back. So artificial feeding had finally to be used.

HOUR-GLASS CONTRACTION OF THE UTERUS DURING LABOR.*

BY

ELMER SOTHORON, M. D.,

Washington, D. C.

THE subject which I present for your consideration to-night is one to which every physician, whose duty carries him into the lying-in room, should give more or less consideration. It is one of those bug-bears that will, sooner or later, make its appearance during the management of labor—sometimes very unexpectedly—when we will find ourselves ready to grasp or use any means that will right this very trying condition.

Physicians, as a general rule, have a tendency to lay aside certain complications of labor, which do not occur daily, for future consideration. While it is true and, at the same time, fortunate, that these complications do not arise in every case of labor, yet we should always have that practical knowledge which will give us the necessary confidence to deal successfully with them.

The various causes of spasmodic contraction of the uterus, commonly called hour-glass contraction, have been given by a number of writers. The most common ones suggested are irritation within the uterus, abuse of ergot, abnormal adherence of the placenta and prolonged use of chloroform or ether. In 1884, this subject was extensively discussed in British medical journals and most of the writers expressed a decided opinion that the abuse of ergot in the second stage of labor was the chief cause.

Also about the same time the Philadelphia Obstetrical Society devoted much of its time to this subject. Dr. Harlow, its president at that time, in introducing the subject remarked that it was

* Read before the Washington Obstetrical and Gynecological Society, May 17, 1908.

a well-established rule in this country that ergot should be given at end of second stage of labor to hasten delivery of the placenta and prevent hemorrhage. He asked the question, "Does ergot hasten or retard the delivery of the placenta?" and claimed that ergot sometimes overacts and produces irregular contraction of the uterus, thereby retarding the expulsion of the placenta.

Some have thought that this irregular contraction could take place only when the placenta was attached to a side of the uterus, others only when it adhered to the fundus. Budendorf, Aschern, Péan and other writers have recorded cases where a portion of the placenta was inserted in the uterine end of the Fallopian tube. While the location of the placenta, as just mentioned, may act as a factor in these cases, yet I do believe that the majority of them are caused by either one of the following two conditions:

First.—An abnormally adherent placenta acting as an obstacle to contraction over the placental site, while the rest of the organ assumes its physiological function. The uterus, seeming to recognize the fact that an extra effort is required to throw off the adherent placenta, contracts with unusual vigor. The site of the placenta, being the weakest part of the uterine wall, contracts with the least energy and remains in a state of comparative inertia, and so the placenta becomes encysted.

Second.—The premature rupture of the membranes and the loss of the entire amount of amniotic fluid, either spontaneously or gradually, allows the uterus to retract at a certain place, and conform itself to the surface of the fetus. After the expulsion of the child, the retracted portion of the uterus being free assumes its physiological duty, thereby forming this annoying central stricture. This stricture is either the internal os or the ring of contraction (Bandl).

I believe clinical evidence will bear me out, when I say that, in the majority of cases, we will find, after passing this central constriction, we have either a partially or a completely adherent placenta to deal with; or we find a condition entirely opposite—a free placenta held within this cavity by a powerful constriction, the location of which, in this latter class of cases, is nearly always at the internal os or, properly speaking, the internal os itself. This condition, in my opinion, is caused by the early escape of the amniotic fluid—nature's hydraulic dilator—the duty of which we know to be a forerunner of the presenting part, not only dilating the internal as well as the external os, but also acting as a liquid distender, causing uniform contraction of the uterus and, on

mechanical principles, preventing spasmodic contraction. The mechanism of this condition is easily understood, if we recollect the strong disposition of the uterus, and especially the internal os to contract or narrow itself, when the distending cause is removed and while the placenta remains undelivered.

Artificial irritation by too frequent examinations and awkward application of forceps have been mentioned as a prominent factor by some writers. The fact that artificial irritation of both the external and internal os is nearly always produced by the different methods of inducing premature labor seems to explode such a theory; since hour-glass contraction rarely occurs in premature labor, where the early rupture of the membrane is prevented.

Meddlesome midwifery, has undoubtedly a great deal to do in bringing about this condition, such as the early rupture of the amniotic sac, the abuse of ergot and other drugs as mentioned and the too hasty attempt to deliver the placenta by traction on the cord, but I do believe sometimes an abnormally adherent placenta will produce this condition in spite of the physician's best attention; in fact, he has no way to prevent it, as the contraction or stricture is forming while the birth of the child is engaging his attention.

Hour-glass contraction of the uterus may be known by the fundus reaching abnormally high, by an elastic feel of the cord and no pains attending, and on palpation the uterus is found irregularly contracted. The placenta not being in reach of the finger, the hand is introduced, and the cord is found to pass through an aperture of greater or less size, and the placenta felt to lie within the cavity formed by this contraction.

Finding ourselves embarrassed by such a complication, the treatment should depend upon two conditions:

First.—A partly adherent placenta contained in a cavity whose walls are poorly contracted, thereby producing hemorrhage.

Second.—A retained non-adherent placenta contained in a cavity whose walls are firmly contracted and with little or no hemorrhage.

I believe that the time for the interference of the physician in the delivery of the placenta in these cases, should be regulated by the condition of the uterus itself. If we are to deal with the former class of cases, then we must act quickly; measures must be adopted to empty this upper cavity, and secure firm contraction of the uterus in order to prevent hemorrhage. In the

latter class, where there is no hemorrhage, I advocate waiting a reasonable time. In the majority of cases, however, this is in vain, for time by itself can neither produce the conditions required, nor command them if they be absent. I have always objected to making "time" the criterion for action in the lying-in room and my aversion is by no means abated. A practical knowledge of the mechanism of labor and certain pathological conditions, but not the hands of a clock, should be our guide. In dealing with the complications of labor I am sorry to say that some physicians still obey a direction but too commonly taught a few years ago that a certain period of time must elapse before any attempt be made to deliver an imprisoned placenta, not considering at all the necessity for immediate action in a certain class of cases. By following such advice, we may let the proper moment pass for the successful application of a well directed force.

In this trying condition, especially in a case with more or less hemorrhage, it becomes always a matter of necessity to operate, and this should be undertaken as soon as this situation is ascertained. Antispasmodics and other drugs have been tried without the slightest success. We cannot trust the expulsion of the imprisoned placenta to nature; unfortunately, she has been overworked or prevented from doing her duty, by being robbed of force by her prisoner. It is in vain that action of the uterus is solicited, or that any force, however well directed, is applied to the cord; nothing but the introduction of the hand, and that made to pass the stricture, can relieve the placenta from its confinement. It is to the patient always an operation of severe suffering, however well conducted, unless the stricture resists very moderately; therefore to add to it, by rudeness or maladroitness, is both cruel and dangerous. In this operation we should remember that in introducing our hand into the uterus, we have the expulsive force of this organ to antagonize; so in order to partly overcome this force and to relieve our patient of pain, I believe in the majority of cases the use of chloroform is justifiable. By its use we avoid resistance on the part of the patient; besides the passage of the hand through the stricture is certainly made easier, although Johnstone and others claim that the use of chloroform exerts no influence whatever on the stricture.

The patient must be placed upon her back, thighs flexed and the knees well separated, the hand introduced into the vagina and forwarded agreeably to the direction of the cord, which

should be taken always as a guide. This will be found passing through an aperture of uncertain size—sometimes large, sometimes smaller—into which the fingers, one after the other, must be introduced and its dilation gradually effected, until the whole hand is enabled to pass the stricture. When the hand has possession of the chamber which contains the placenta, this mass must be separated carefully, if it be adherent; or if loose, it must be seized with sufficient firmness to secure its following the hand when this is withdrawn.

Some little management is required in withdrawing the placenta, or rather in seizing it. It must not be grasped by the whole hand and kept in it while contracting the fingers, or its bulk with that of the hand will exceed the opening through which it has to pass. This is not an unusual predicament and has sometimes been attempted to be overcome by force, to the embarrassment of the operator and to the serious injury of the patient. During the introduction of the hand in the uterus, and especially while contending with the stricture, the uterus must be fixed firmly with the other hand, it being pressed upon the fundus while possession is taken of the placenta and the hand is withdrawn. After the placenta is delivered, I have thought it always best to reenter the uterus to the very fundus, so as to be certain that a portion of the placenta is not left behind. Firm contraction should always follow, and if we find, after we have emptied the uterus, it has failed to do so, we should, by the use of ergot or the continuous use of compression force the same.

I submit for your consideration the following conclusions:

1. Avoid meddlesome midwifery, such as early rupture of the amniotic sac before it has thoroughly performed its function, as a dilator or distender.
2. Avoid the use of ergot or other drugs of similar action until the completion of the third stage of labor.
3. Avoid interference with normal uterine action by the prolonged use of chlorform or ether.
4. Avoid the danger of stimulating spasmodic uterine contraction as well as danger of rupture of the cord by an attempt to deliver an adherent placenta by traction on the cord.

The result of this latter procedure, I am sorry to say, I have witnessed twice. It is in vain to attempt the delivery of the placenta by any traction made upon the cord. By traction on the cord, the whole of the uterus will sink lower in the pelvis; the physician imagines that the placenta is descending; he continues

his traction under this illusion, forgetting that there is a powerful resistance at the other end. Thinking that a little more force will overcome the difficulty, he multiplies it; the cord is ruptured, and his difficulties are increased. He now becomes alarmed, the panic spreads to the patient and her family, a consultation is demanded, and another physician robs him of the reputation he might have acquired by the exercise of a little discretion.

1921 I STREET, N. W.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of May 12, 1908.

The President, EDWIN B. CRAGIN, M. D., in the Chair.

DR. H. GRAD reported

TWO ABDOMINAL SECTIONS FOR PYOSALPINX CLOSED WITHOUT DRAINAGE.

CASE I.—Mrs. B., aged thirty-two, was seen on March 29, 1908. The attending physician said that patient had been in bed for seven days with abdominal pain and fever; the temperature ranging between 99 and 103. His diagnosis was pelvic peritonitis and retroversion. For the past three days, patient developed vomiting and incessant retching, which did not yield to any therapeutic measures. Bowel movement could be obtained by enemata, but the vomiting could not be controlled, continuing even when under the influence of morphine. Patient's condition has grown steadily worse. Facial expression is that of a septic woman. Pulse, 140; temperature, 104. Extreme tenderness at the lower part of abdomen. Bimanual examination reveals a full pelvis, very tender to the touch. Fundus of uterus cannot be outlined. It seems to be buried in the general inflammatory mass, which extends above the true pelvis. Patient retches and vomits in a most distressing manner. The following day at the hospital the leukocytosis was found to be 21,000; polymorphonuclears eighty-two per cent. An attempt was made to control the vomiting and retching by gastric lavage. The patient was propped up in bed and stomach washed with two quarts of normal salt solution. Before removing the stomach-tube, half an ounce of epsom salt, in solution, was allowed to flow into the stomach. No retching and vomiting followed the lavage for eight hours. During this time patient had a good sleep. The next day, temperature, 105; pulse, 140-150. Stimulents given. Bowels moved well. No improve-

ment in her septic condition. Temperature and pulse high. Retching controlled by lavage. Facial expression not encouraging.

Under anesthesia, the inflammatory mass proved to be situated high up. Exploring needle shows free pus, but high up in the true pelvis. Uterus fixed, immovable. Abdomen opened from above. Omentum, sigmoid, cecum and intestinal loops adherent over the pelvis. Abdomen protected by pads. As soon as intestine was liberated, free pus welled up. Rapid evacuation of two large pus-tubes. Patient's condition very critical. Right ovary allowed to remain. Bleeding-point stopped and abdomen closed without drainage. Patient on the table fifty minutes. She is in very critical condition. Profound shock. Stimulant and transfusion given. For twenty-four hours following operation, patient's condition very critical. Gradual improvement then began, and on the sixth day her temperature reached the normal.

From this day on the temperature began to rise and fluctuate. Inspection of the abdominal wound showed no tenderness. Pelvic examination negative. A few days later the temperature having no tendency to subside, the lower angle of abdominal wound was reopened. Dark, bloody serum escaped, but the temperature did not subside. Vaginal examination now showed a slight fullness in the cull-de-sac. Patient's condition septic. Temperature, 104. Pulse correspondingly high. Under anesthesia, an exploring needle introduced behind the uterus brought out dark, bloody fluid, the same in appearance as that drained out of the lower angle of the abdominal incision. Cul-de-sac freely opened. About six ounces of dark blood escaped. No pus was found either in the wound or pelvis. A small gauze drain introduced. For several days the same dark bloody fluid drained from the pelvis, the temperature gradually subsiding with recovery of the patient.

It seems to me had drainage been introduced in Douglas space in this case nature would have attempted to shut off this foreign material from the general pelvic cavity and when the infectious dark, bloody fluid began to accumulate, it could not have found its way into the pelvis, where subsequently it became so accessible for removal and drainage.

CASE II.—Mrs. R. was seen on April 4, 1908. She had been in bed for about ten days with abdominal pain and backache. She was treated for appendicitis. Temperature did not range over 101. Pulse, 120. Marked distention of abdomen with tympanitis. Difficulty experienced in getting bowels to move. Patient's general condition good. Examination shows a mass in the pelvis, reaching up to the umbilicus, more to the left of the median line. After admission to hospital, attention was directed toward diminishing the abdominal distention with mild catharsis and enemata. Lenkocytosis, 18,000 polymorphonuclears eighty per cent. Five days later, the abdomen was

opened by a median incision. Universal omental and bowel adhesions were encountered. A large mass adherent nearly up to the umbilicus was mapped out, which proved to be a large pyosalpinx. As soon as the bowel was liberated, free pus welled up. Patient went into a state of collapse. Rapid enucleation of both pus-tubes was effected. Abdomen closed without drainage. The collapsed condition of the patient called for hasty completion of the operation. Patient placed in Fowler position, stimulated and transfused. She remained in a critical condition for about forty-eight hours, then a gradual improvement took place. On the tenth day, the abdominal incision showed some bulging and tenderness. On reopening the wound a large quantity of foul smelling serosanguinous fluid drained out. This drainage became purulent and kept up for about ten days, when it ceased abruptly, the wound healing by granulation, patient making a good recovery. At no time did the cul-de-sac show any sign of disturbance. Had posterior drainage been placed in the case, no benefit could have been derived from it, as the infected area in the abdomen was above the cul-de-sac. The posterior drain, under such a condition would have acted more as a foreign body and complicated the case.

DISCUSSION.

DR. WARD.—In my practice I almost always use a gauze drain, wrapped in rubber tissue, through the vagina in cases which are acute infections. It seems to me it is safer, if you have an acute infection as shown by the blood-count, at that time. In the old chronic cases no drainage is necessary. The main point in cases such as Dr. Grad reports is to decide whether it is an acute infection at the time of operating or not; and to act accordingly. Acute infections in the pelvis I prefer to attack from below rather than from above, if it is possible to do so, and to make a secondary operation later when the acute stage has subsided.

DR. CHAMBERS.—It is absolutely impossible to drain an abdomen. I have seen a great many cases where an attempt has been made. The gauze has been put in in different directions. Many of those cases have died, and on subsequent postmortem it has been found that the gauze only drained a very limited area and that there was a great deal of free or serum in the abdominal cavity. My pus experience has been that where you put in gauze, within twelve hours nature shuts off the gauze and the gauze does not drain; it acts simply as a foreign body. I have for some time now ceased to drain abdomens, no matter whether there be free pus or not. I clean out as easily and as quickly as I can and close the abdomen, and nature takes care of it a great deal better than you can possibly do. In these cases of Dr. Grad, I am satisfied that in the one where the discharge accumulated in the cul-de-sac, if he had put in a

drain the woman would have died. It would have shut off the discharge from the cul-de-sac.

DR. GOFFE.—The point, as Dr. Grad has said in his remarks, is whether or not we should drain the pelvis in cases where we have large accumulations of pus. Now, I am a great believer in drainage, and especially in gauze drainage, but I do not drain through the abdominal incision. In the cases where I operate through the abdomen and find about such a condition as has been described, I invariably make an opening in the Douglas's pouch into the vagina, and pass gauze down from above into the vagina for drainage. Whether the peculiar gauze that I use may have a different effect from that which is used by other operators, I do not know, but my experience has been and my belief is that this gauze, when placed in the pelvis and carried down into the vagina, will drain for thirty-six hours, and drain very efficiently, and instead of its influence being confined to a very small pocket, I believe that it is a stimulant to the entire peritoneum of the abdominal cavity. The amount of serum that is poured out in many of these cases could not possibly be secreted by any limited space or surface of the peritoneum.

I pack the pelvis quite full of gauze in these cases, until the intestines are pretty thoroughly lifted up out of it, carrying one end into the vagina. Now, it is not an unusual thing during the first thirty-six hours to have the gauze not only saturated with the serous discharge, but to have the latter carried out on to the gauze pads that are exterior to the vulva; and where the cases have been neglected, I have seen it go clear through the mattress on to the floor. The Fowler position aids materially in securing favorable results. At the end of thirty-six hours the stimulant is exhausted, and then we have a plastic exudate that begins to shut off certain areas of the peritoneum; but that is a good thing at that time; it is protecting against any invasion from without, and gradually the gauze is removed.

In that first case of Dr. Grad's where there were several ounces of dirty, bloody accumulation, the latter would have been drained by the gauze, or it would have been absorbed in the meshes of the gauze, and as the gauze was gradually drawn out it would have been removed. That has been my experience. The gauze is drawn out very gradually from day to day—not all removed on the second day or the third day—but on the second day begin to draw it out and pull at it every day, getting out from three to six inches, according to the resistance offered or the pain occasioned by the pulling. I never yet have seen a case where I have used this method that any possible harm has been done, and my judgment is that, on the contrary, I have saved a great many cases that otherwise would have been fatal.

One important feature in connection with gauze drain is keeping the gauze moist. This is accomplished by boracic acid douches given two or three times a day. As long as there is

anything to drain, the gauze will carry it off if it is kept moist. This is true of external drainage as well as of vaginal.

Going back a little to consideration of the route of attack in these cases, I thought there was a pretty general agreement in the profession at the present time that large accumulations of pus, attended with high temperature, were always evacuated through the vagina, before any attempt was made to attack them from above. My experience has led me to adopt that method, and I have seen reports of work by other men in which their death-rate has been tremendously reduced. I now have in mind especially Dr. Noble, of Philadelphia, who reports his experience in dealing with cases of this character above and below. He found that while he had a death-rate, in dealing with them through the abdominal incision, of twenty-five per cent. when he changed and attacked them through the vagina, evacuating accumulations of pus, and later attacking them in a radical operation, he reduced his death rate to between two and 3 per cent. He is only one of many men who have reported similar experiences.

DR. CRAGIN.—Will you be good enough to state the kind of gauze you use, Dr. Goffe?

DR. GOFFE.—I use an iodoform gauze of ten per cent., that has been soaking in a bichloride solution, 1 to 500, for an indefinite period; when I am about to operate on a case where I think gauze is required, I remove from the jar the amount I think is going to be necessary, and put it to soak in a large basin of hot water. There it soaks throughout the operation, and when I get ready for it, it is wrished around in this basin of hot water and wrung out as dry as possible. It begins to drain as soon as it is put in place.

DR. MURRAY.—The fault is that we are discussing two kinds of cases. The two cases that have been narrated are both acute, and I think if we will separate those from the old chronic pyosalpinx cases, which we can operate, and close up the abdomen, even if there is a little pus, we will then see that we have a different subject altogether to consider. Now, I still consider, as Dr. Goffe has said, that the proper treatment in acute cases would be to approach from the vagina, although I believe generally in operating by the abdominal route. I believe that if that case had a vaginal section made, and the pelvis drained, the case would have been in better condition for a secondary operation if it was necessary, and certainly the sepsis would have been to a great extent relieved, so that the patient would have got better. Now, in a case where drainage is to be done, I think it should be done through the vagina, and that the patient should be in Fowlers position so as to drain. If the doctor had done that first he would not have had a secondary rise of temperature. Now, there is another point about the free pus. There was in neither of these cases free pus; but I believe if there is free pus in the abdomen, that one of the very best things

is frequently, as the doctor has described, not to endeavor to take away the cause of the free pus—a ruptured tube or ruptured appendix—unless it can be done without handling the intestine or abrading the peritoneum; but the first thing to do is to make openings in the abdomen and drain well and in the course of forty-eight or seventy-two hours the patient is in so much better condition that you can then operate for the cause and take it away. I have been impressed time and again when I have seen ruptured appendices with pus in the abdominal cavity, where the endeavor to take out the appendix the same as we take out a pyosalpinx tube would be absolutely fatal. We might as well let the patient die without that operation, and there would be no endeavor to save; but by making an incision in the loin and draining, in the course of three days the temperature subsided and the case was better, so that an operation could then be done for the appendix, and it was taken out, and the patient recovered in a case where I think there is not an operator in this room would have said there was the slightest chance for that result. I think we must keep ourselves absolutely accurate in our statements when we talk about free pus and when we are considering acute or chronic pyosalpinx. As regards drainage, I do still believe that drainage does occur through gauze from the immense amount of discharge. We reduce the congestion of the peritoneum and certainly we diminish the sepsis in these patients, as the temperature falls, pain diminishes and they get well, where otherwise they would not recover.

DR. BROTHERS.—The subject of drainage is always a live topic. I do not know any one subject which has undergone so many changes within the last fifteen or twenty years as the treatment of pus in the pelvis, with or without drainage. The first method that I was taught to follow in these cases was drainage through the abdominal wound, with the glass tube introduced to the bottom of the pelvis. That method is still followed by certain operators whom I saw in Paris, particularly Tuffier, perhaps six or eight years ago. The work of Clark, of Baltimore, cleared up the atmosphere in regard to the error of draining all pus cases. We know, as a result of his investigations, that a little pus of the chronic or particularly the gonorrhoeal varieties, may soil the peritoneal cavity without any danger. As a matter of fact, the chronic or subacute cases of pus-tubes on which we operate usually make a better recovery if we do not drain. I think that we all have seen these speedy recoveries, and I know quite a few that I have had out of bed within the first week after closing the wound without drainage. The pendulum, however, is apt to swing always too much in one direction or the other; and it is wrong to omit drainage in every case. Personally, I feel that Dr. Chambers may be wrong when he has discarded drainage altogether in his pus cases. For instance, as has been pointed out by Dr. Ward to me in a private talk just now, we meet cases of appendicitis that we must drain through the abdomen. The vaginal route of drain-

age, however, has its indications, and where we have extensive suppurative processes going on, I do not know of anything better than the removal of the uterus with the pus tubes in order to give the freest kind of drainage. Whether it is done through the vagina or above is a matter for individual opinion. Personally, I occasionally take out the uterus in connection with pus-tubes, where the pus-tubes and entire pelvis seem to be intimately involved with the uterus itself in the suppurative process. I believe that it is wrong to say that you have got to drain every case; I believe that it is wrong to say that you can get along without draining in every case. I believe that Dr. Murray has hit the nail on the head. Whether cases are gonorrhoeal or whether they are septic, whether they point to the vagina and permit of a vaginal incision or not under these different circumstances the individual operator must use his judgment in each individual case and decide whether he is going to drain, or whether he is not going to drain; or whether he is going to drain through the lower portion of the abdominal incision, or whether he is going to drain through the vagina. As a matter of fact, I wish to summarize my remarks by saying that the treatment of pus-tubes, after all, is a matter of judgment in each individual case.

DR. JEWETT.—My experience agrees with that of Dr. Goffe. I have had the most satisfactory results in free drainage by the vagina, which I think is most imperative in acute pus cases. In chronic pus-tubes, especially where the infection is gonorrhoeal, the matter can better be handled by the abdomen. I have never had reason to regret draining from below. I have sometimes regretted its omission.

DR. STUDDIFORD.—After placing gauze in the pelvis, I do not think that adhesions form of necessity. I have in mind one case with large pus-tubes, in which hysterectomy was performed and the pelvis packed with gauze, which was drawn out through the vagina. The woman had a very severe convalescence, but eventually recovered. About eight months later she contracted an acute disease and returned to the hospital, and was in the hospital some three months, when she died. At the autopsy I was very much interested as to the condition of the pelvis, in view of the severe operation that she had had, and was surprised to find that it was absolutely free from adhesions. The only thing that could be seen was a white line marking the scar across the broad ligament. That is probably the history of a great many of these cases. So I think Dr. Grad was not justified in saying what he did about using gauze.

DR. WELLS.—The question of drainage in pelvic cases is of great interest. Personally, I very seldom drain a pelvic pus case. I never drain them through the abdomen, but do occasionally drain through the vagina if the case is acute and there is free oozing. As to the cases that Dr. Goffe spoke about, I thought it was settled long ago that where a patient had a big pelvic abscess, with a high temperature, we should always open through the

vagina and drain, and afterward do the more radical operation if it became necessary. In the cases with pelvic abscesses and a normal temperature, either the pus has become sterile or the patient has developed a resistance to the toxins in that particular pus; in cases like that, if I can leave my pelvic cavity reasonably clean and reasonably free from disturbed peritoneal surfaces, I do not drain. As to the formation and persistence of adhesions, this last week I operated on a case on which three years ago I did a very severe operation for pus-tubes; the patient was drained with gauze in the vagina and had a very critical, prolonged, stormy convalescence. At the patient's earnest request, one ovary was left in at that time, and because of constant pain caused by that ovary I was obliged to make a second operation. Much to my surprise there was not a trace of adhesion anywhere in the pelvis except about the ovary. Some years ago I operated on a policeman's wife for an acute puerperal abscess on the right side of the uterus which had ruptured before operation. The pus was free in the patient's peritoneal cavity and her condition desperate. She was drained with gauze through the abdomen and vagina. She had a stormy convalescence and hardness for some months over the lower part of the abdomen. She died three years later of typhoid. An autopsy was made, and not a trace of adhesion was found in the cavity. So that it is perfectly certain that the presence of gauze drain in the cavity does not necessarily cause permanent adhesions and that adhesions may be absorbed by natural processes within a limited period of time.

DR. GOFFE.—Temporarily certain areas are cut off by these adhesions; that is, by the plastic exudate that binds the coils of intestines together; but in the majority of cases this all clears up very promptly. When, again, the serous membrane begins to secrete serum, it digests it and absorbs it and it disappears. I have come to the conclusion that adhesions remain permanent only when they have become infected, so that nature goes on and organizes against resistance; then we have permanent adhesions. Otherwise, they are always absorbed.

DR. GRAD.—In speaking of free pus in the peritoneal cavity, I did not mean to convey an impression that there was free pus in the sense that as soon as the peritoneal cavity was opened pus flowed out; but I believe that pus had broken through the wall of the tube, and the adherent omentum kept it from spreading; just as soon as I liberated a loop of intestine free pus flowed. Three days before the operation, case No. 1 had a marked chill and rise of temperature, attended with a great deal of pain, probably the rupture of the tube had occurred at that time. I was encouraged to close these two cases without drainage, because I have seen the splendid results in Dr. Chambers' cases. He closes these cases up, and they do very much better than when drainage is used. If we can remove the infected tissues and leave a clean surface, there is nothing to drain. As to have done a vaginal section first in these two cases, as recommended by Dr. Goffe, and

then an abdominal operation, I can only say that the pus could not be reached from below. An attempt was made, but the pus-tubes were situated high up, and one could not have evacuated them without considerable risk to the intestines immediately surrounding the inflammatory mass. In one case I was able to get pus through an aspirating needle by the vagina, but I had to introduce the needle quite a distance before I could get pus. I made several punctures, and in doing so ran considerable risk. Finally, I was forced to go from above. Had I been able to reach the pus from below, I would have evacuated the pus first and allowed the patient to recuperate before the final abdominal section.

DR. P. F. CHAMBERS read a paper on

DISEASES AND INJURIES OF THE CERVIX UTERI.*

DISCUSSION OF DR. CHAMBERS' PAPER.

DR. WARD.—I would like to speak in regard to the treatment of cervices that have been originally infected with gonorrhoea and present the condition of hyperplasia with lacerated or everted lips, and cystic degeneration of the glands and which pour forth a profuse cervical leukorrhoea, which will not yield to ordinary measures. Hunner of Johns Hopkins Hospital, not very long ago, brought forward a treatment of such a condition by the use of the Paquelin cauterium, making radiating burns on the surface of the cervical muscosa to destroy the glands. There is practically no pain by this method and it is available for office treatment. The cauterium is used to make radiating burns about an eighth of an inch deep extending from the internal os to the external os—two or three burns at a treatment. An interval of five or six days is to elapse before the next treatment. In that way, in the course of a few treatments, you practically destroy all this secreting glandular tissue which is productive of this very disagreeable leucorrhoea.

DR. STONE.—It seems to me that the point Dr. Ward has just spoken of is one that is worthy of some consideration, and I should be very glad to know the experience of the men in this society in regard to the treatment of those conditions, because I am sure that we all appreciate how obstinate this discharge is and how hard it is to cure. Recently, I have thought that the results might be accomplished just as well by the use of the knife; so that within the past few months in several instances I have taken occasion, at the time the patient is under the anesthetic, to make pretty deep cuts with the knife, radiating all around the cervix, in much the same way that Dr. Ward has described with the cauterium; and in these cases also I followed this treatment up for five or six or eight weeks subsequent to the operation, and I have been greatly satisfied with the results. They have been very much better than any results that I had previously obtained by simply scraping the mucous membrane once or

*See original article, page 446.

twice or with the application of carbolic and iodine or any of the other drugs that have been used for this purpose. It simply, whatever the cause, destroys these glandular structures. The cautery is a hard thing to keep in order, and we are oftentimes without it.

DR. WARD.—I have employed an electric cautery knife instead of the Paquelin knife for the same purpose. It is easier to handle in ordinary cases. This treatment does not cause any violent reaction. The point to be emphasized is that you do not want to do too much cauterizing at each time and to wait five or six days until the reaction from the previous treatment has subsided, and then make two or three more incisions in different parts, and in that way three or four treatments would practically accomplish the purpose of destroying the secreting glands. It is only suitable in those cases where there is a marked eversion of the lips, or the cervix is lacerated pretty well up, so that you can pass the cautery knife easily beyond the external os. It certainly is, to my mind, a valuable method of treating those cases where there is a very profuse, viscid, cervical leucorrhea, which is so common after a gonorrhoeal infection of the cervix, and which you can practically never obliterate by ordinary applications. It requires either something of that kind or amputation of the cervix to cure these cases.

DR. WEST.—There is a point in Dr. Chambers' paper which I should like to discuss, and that is the treatment of epithelioma of the cervix which is apparently just beginning. The doctor has advocated high amputation, extending up to the internal os, or even higher if the carcinoma has proceeded further. It seems to me that we have no means of determining, even approximately, the extent of the growth or the extent of involvement of the uterus. Even the smallest point of carcinoma may have involved parts much higher or the bases of the broad ligaments, or have sent little deposits out far afield from the point of attack. I believe, therefore, that wherever we have a positive diagnosis—and we should always attempt to make our diagnosis positive in such cases—we should remove the uterus in as complete a manner as possible, and I believe that this should be done by beginning to excise the vagina with a cautery, dissecting up part of the vaginal wall a fair distance—and then proceeding by the abdomen, unless there is some contrary indication to that, and removing broad and round ligaments as much as possible, even to the point of entrance of the latter into the canals; in other words, clearing out the structures just as well as possible in every case where you can at all establish that you have malignant disease of the cervix.

DR. JEWETT.—With reference to treatment in catarrh of the cervix, most frequently gonorrhoeal, I have used the method of Craig with some satisfaction, but with many partial failures. I have more recently pursued the plan mentioned by Dr. Ward, which I think was proposed by Cullen—deep cautery lines, four or

five in number, on each face of the cervical mucosa. I have employed a common platinum loop or knife heated by the street current. The treatment has not been repeated as often as every five days. The patients have reported a profuse watery discharge lasting for about three weeks. Not until the end of about that time or a month have I repeated the cautery. The amount of discharge has been very much abated after a time, and in a large proportion of cases completely cured. But it seems to me there is a possible danger in it in gonorrhœal infection; I would like to know the experience of others. In a case now under my care, a re-infection of endometrium and the tubes occurred after the cautery, and in still another it seems to have re-kindled an endometritis.

DR. CRAGIN.—How long after the first infection was the first treatment instituted?

DR. JEWETT.—In the first case it is now five years since the infection began. At the time the cautery was first applied, the infection was latent, except for a profuse cervical discharge. There had been infection of the tubes, and I had opened them both by vaginal section about two years before the use of the cautery. Except for the cervical discharge, the infection had subsided and the woman apparently was in perfect health. Within a short time after the cervix was cauterized, there was evidence of active infection which resulted in a pus collections in the inner end of one tube. The woman is young, is unwilling to lose any of her pelvic organs and the pus-tube is being treated by vaginal drainage.

DR. MURRAY.—From observations made, when I had a large number of these cases under my care in a dispensary, and could follow them, I have learned that where we really determined there was gonorrhœal infection of the endometrium there was almost always an infection of the tube—a pyosalpinx; that was why a good many of those cases did not remain permanently cured. I have in those cases examined carefully a number of times the secretion from the male in order to see that there was not a reinfection from a latent gonorrhea, but I have not discovered that it was the cause at all. I have come to regard many cases of reinfection as proceeding from conditions in the tube which we cannot get at, no matter what we do to the cervix. I tried the cautery first some years ago, after Dr. Byrne had spoken so much about its use in the treatment of carcinoma and epithelioma of the cervix, and used it then to destroy the glands, and was satisfied; but I had much the same experience as Dr. Jewett. Every once in a while I would light up a case of acute tubal trouble, and twice I had to operate.

DR. WALDO.—We have all had infections of the cervical canal give us much annoyance. A few years ago, I used the electric cautery to destroy single glands in the cervix. I have curetted in a good many instances, with very little success. The last two years I have destroyed every cyst that could be found, have

secured free drainage from the cervical canal, and then, instead of cleaning the mucus out with pieces of cotton or a syringe, have made a very thorough application from the internal os out with peroxid of hydrogen, and continued the application until every particle of material was removed from the cervical canal, and have then applied the tincture of iodine. This may seem very simple, but it is not. In my hands it has been, in quite a number of cases, successful in curing cervical endometritis. A number of women have become pregnant after this treatment.

There is another point in the paper that is very interesting to the entire medical profession, and that is whether we should or should not perform amputation of the cervix in the early stages of epithelioma. A number of years ago that was quite a proper thing to do. Most of us have performed high amputation, and perhaps have removed a good deal of the adjacent vagina in these cases. After following this method of treatment pretty generally, it was abandoned simply because the disease was so apt to return. I, for one, object to replacing the present method of an extensive hysterectomy by the older operation of high amputation of the cervix.

DR. MABBOTT.—Dr. Chambers has referred to the nerve-supply of the cervix, its lack of sensitiveness to injury, and I would add also, as I suppose it applies, its lack of sensitiveness to heat or temperature. As stated in the paper, the vaginal douche is still in general use for various purposes; but for an interior cervicitis, so far as its cleansing is concerned, it has never seemed to be any more valuable than washing the face is for the purpose of cleansing the inside of the nose. Nevertheless, I have my patients use the vaginal douche, as I find that nearly all who treat these cases otherwise than by ablation recommend the douche, and that many come to me, to the New York Hospital, who have used the douche under my direction, as well as under the direction of others, and I find that they have done injury to themselves by using the douche: first, mechanically, by plunging the douche nozzle directly against the cervix. It is wise, I think, to advise the patient to put the douche nozzle in more or less towards the side, carry it up pretty high, and then gently move it about. Secondly, I find that patients sometimes—in fact, frequently—come back, and they have a little blister on the cervix; they have an erosion not exactly at the mouth of the uterus, but on some other part, usually the anterior lip, that is evidently due to scalding by the water as it escapes from the douche nozzle; and I say to the patient, “Have you used it too hot?” She says, “I have used it as hot as I can. I was told to do so.” And I say, “I intended to have told you to use it as hot as you can without the slightest danger of scalding.” If a patient is to use a thermometer—a bath thermometer—to determine the heat of the douche, I think a temperature of 110 is best. Now, another thing: I find that it is customary to advise these patients to use a vaginal douche, and that there are only a few that seem to realize afterward that

they have been told how to use the douche. I believe the douche should always be used in a recumbent posture, the patient on her back, with her shoulders lower than her hips, and there is a special reason for this, as in this position the vagina holds water. I believe the principal usefulness of the douche is this: that in nearly all of these cases there is an associated congestion and hypertrophy of the cervix, and the effect of a prolonged application of hot water on that surface is similar to that of water or soap suds on a washerwoman's hands. In one or two or three minutes the parts become congested and full of blood, but in ten or twelve or fifteen minutes they become wrinkled and shriveled and the veins are squeezed; the arteries are not compressed; they bring in just as much blood. But the capillary and venous engorgement are overcome by this squeezing of the entire tissue of the cervix, promoting a return to a state of normal nutrition in place of the existing hyperplasia. It is important to tell the patient not to hang the douche bag too high; it should be hung only a foot and a half or two feet above the level of the hip so that the water will run slowly. I explain all this to the patient, and I find that after I have used the illustration of the washerwoman's hands, the patient always uses the douche slowly, and always lies on her back to get the drinking effect that we desire from the hot water as well as the cleansing effect.

DR. POMEROY.—Most of the discussion this evening has been on inflammatory conditions of the cervix. I may be pardoned for making a brief report of a peculiar injury to the cervix that occurred at the Kings County Hospital on Saturday. We have all seen cases in which the forceps have been applied recklessly and carelessly to the undilated cervix, and presumably the forceps have been forced into the lateral fornices and some portion of the cervix torn away. The injury in the case I refer to might be compared to that except in the respect that it was more excusable. When I saw the case the child's heart had gone up to 170 and the patient was in poor condition and the head still in the cavity. The cervix was nearly obliterated except for the edematous anterior lip. I arranged for the interne, who had not had any great experience with forceps, to deliver with forceps, and he made the application satisfactorily. I had some difficulty in instructing him how to make the axis traction without axis traction apparatus, and on delivery of the patient I found projecting from the anterior commissure the edematous anterior lip of the cervix perforated by a "buttonhole" as large as a half-dollar. The injury was obviously a result of incorrect traction and compression of the edematous lip between head and symphysis. It is hardly necessary for me to explain that amputation of the two horns of that dilemma was the only way out of the difficulty. There was no hemorrhage whatever.

DR. GRAD.—In cases of chronic cervical catarrh I have used a method of treatment that has given good results in those cases where there was no infection; cases that were simply

chronic. I have found that gradual dilatation and sounding has been very effective. Without cauterization, without using harsh measures, without harsh applications, I could get a cervix into a normal condition in very much shorter time than by other methods. When granulations are present I have used balsam of Peru and castor oil, a mixture that is used on fresh wounds in surgical clinics. I have not used the cautery method that has been described this evening. As regards the traumatic cases, I was much interested a few weeks ago in seeing a case where I was called in by the family physician, who said that something very peculiar was protruding from the vagina. On examining the protruding piece of tissue, I found that it was eight inches long, and about an inch broad. I traced it up to the uterus and found that it was a complete tear of the cervix and only hanging on to the organ by a very small pedicle. I tied it off because I was not in a position to do an operation for stitching it in place. In looking up lacerations of the cervix, I came across some interesting statistical studies: First, as to the seat of the laceration. It has been found that the lacerations are on the left side in about 40 per cent.; on the right side in 14 per cent.; on both sides in 30 per cent. of the cases. It is said that under absolutely normal labor the lacerations will occur in 12 per cent.: in rapid deliveries in about 22 per cent.; while in tedious labors they will occur in 30 per cent. of cases. So you see that the largest number of lacerations appear to occur after a tedious labor. Now, what is also of interest is that in forceps delivery the percentage of lacerations is exactly the same as in normal deliveries. In regard to the after-effects of laceration, the statistics show that only 17 per cent. of cases remain free from some disturbance of menstruation; after a laceration of the cervix severe enough to require an operation, 83 per cent. of cases have some form of disturbance of the menstruation in subsequent years. These studies would point to the value of the operation of repair of the cervix, and even the necessity of repairing lacerated cervixes. I was much interested in a case of severe laceration of the cervix, that had a symptom that was of interest to me in this way. This patient complained of a circumscribed area of pain on the left side of her abdomen, on what would be the (McBurney) point on the left side. This localized pain was very persistent, and it puzzled me for a good while. After I had examined the patient carefully and had her under observation, I advised her to allow me to close the cervix. As soon as that cervix was repaired, the pain entirely disappeared. I believe that many cases of lacerated cervixes produce reflex symptoms.

DR. WELLS.—I wish to call to the attention of the members the very good work recently done by Sampson at Johns Hopkins. His paper was accompanied by some very beautiful plates and sections of uteri showing cancer of the cervixes, and the plates demonstrate very clearly and conclusively that sometimes what

would appear to be merely a tiny bit of beginning of carcinoma on the external os may have a thread of cancer running way up into the cervix or into the parametria. My experience is the same. No matter how small the area of carcinoma may appear to be, your operation must be radical and thorough, for you cannot tell how extensive it is.

DR. CURRIER.—I had intended to be merely a listener this evening, for it has been very pleasant to hear the discussion and to listen to Dr. Chambers' narration of the pathology of conditions which we learned so many years ago under our revered teacher, Dr. Emmet. As I review my own experience, in recent years, away from the more extensive field of the metropolis, I am reminded of the statement of Dr. Emmet, that probably the reason why we see fewer of these pelvic lesions nowadays than we did is because the obstetrical treatment is better; and I must say that I have seen fewer of these pathological conditions of the cervix during the past ten years than when my practice was exclusively here in the city. It has happened to me, within the period mentioned, to be in consultation in no inconsiderable number of serious obstetric cases in which at the time I observe a laceration—a very marked laceration. In following up these cases I have been surprised to see the completeness of the healing process if they receive proper care during the puerperium, so that the necessity for an operation was done away with. It occurs to me that perhaps in a good many of these cases, by milder methods and by careful hygienic precautions, we might obviate the necessity for the operations which have been so frequent in the past. In regard to the catarrhs of the cervix which have been spoken of, my experience, in the last few years, has been that in most cases they would yield to mild treatment, milder than the actual cautery and cutting procedure. Consequently, my surgical experience in this line during this period has diminished, and perhaps I am a little inclined to temporize with cases which years ago I would at once have thought necessary to operate.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON GYNECOLOGY.

Meeting of April 23, 1908.

The President, WILLIAM S. STONE, in the Chair.

DR. CHARLES F. ADAMS reported

TWO CASES OF FECAL FISTULA, ONE ABDOMINAL, THE OTHER ILEOVAGINAL. OPERATION. CURE.

CASE I.—This patient was referred to him July 23, 1907, by Dr. F. M. Burke, of Brooklyn, with the following history. She was forty-six years old, was married at seventeen, had seven

children, the last fourteen years ago. Her labors were all normal, but quite hard; no instruments were used. She had no miscarriages. Her menstruation was regular, every twenty-eight days, always quite profuse, and lasting seven days. She had no pain with these periods. The patient was well nourished and weighed two hundred and sixty pounds. For nearly a year she had a feeling of bearing down but no pain. There was a bloody discharge on intercourse for the past six months, and this was more profuse of late. Her appetite was good and bowels were regular. She had no loss in weight.

Upon examination, the uterus was found to be high up in the pelvis and barely reached by the examining finger. The cervix was completely involved in a cancerous growth and the vaginal walls partially folded in over the growth. There is a serosanguinolent discharge with characteristic odor and the cervix bleeds freely at the touch of the examining finger.

The patient was told that the growth would probably return if removed and the operation was a serious one for a person as stout as she was; nevertheless, she was willing to take the risk and entered St. Elizabeth's Hospital July 29, 1907.

An incision, 25 cm. in length, was made in the median line, and the uterus with appendages removed. This was exceedingly difficult, as a large part of the operation had to be done by the sense of touch. The incision was closed in layers, plain catgut for the peritoneum and chromic No. 2 for the fascia and a subcuticular suture of plain catgut for the skin. There was considerable shock following the operation. On the following day the bowels moved of their own accord and the patient continued to pass gas freely. For the first four days the pulse rate kept around 120 and the temperature varied from 100 to 103. On the fourth day the dressing was removed and a foul seropurulent discharge was noted coming from the lower part of the wound. On the following day there was a separation of the incision down to the fascia with edges all necrotic and smelling very foul. The next day he found the whole incision had given away and the intestines and omentum up through the incision to a level of the skin and held in place only by strips of adhesive plaster over the dressings. The upper portion was covered by omentum, but the lower portion showed the peristalsis of the intestine taking place. The wound had to be dressed very carefully for several days, as he did not care to loosen all of the adhesive strips at one time until adhesions had become firmer. In order to clear up the slough, he made use of the preparation enzymol, which he found to work admirably in digesting the necrotic tissue. On the sixteenth day, and just about as the wound was assuming a healthy appearance, a tiny fecal fistula appeared, no larger than a small probe point in the most prominent loop of small intestine. He had vain hopes that this might close of itself, but he was doomed to disappointment. One morning he touched the opening with the pure stick of nitrate of silver, and the next day he found the

opening the size of a goose-quill and the patient flooded with fecal discharge and the surrounding skin badly excoriated. She was perfectly willing then to submit herself to another operation to get relief. Just one month after the first operation, on August 31, he took her to the operating-room and, after cleaning up the wound carefully, he was able to get into the abdominal cavity at the sides of the wound after freeing the peritoneum from the abdominal wall. He found the intestines bunched up in a mass in the incision, densely adherent and in separating them he made two more holes in the intestine which he had to sew up. The original site of the fistula was soon freed and by removing a wedge-shaped piece from the free border he was able to get healthy tissue to unite, without interfering with the mesenteric attachment.

In closing the intestinal wounds, he used through-and-through sutures of catgut, interrupted, with knots coming inside the gut and Lembert suture of catgut over this. The abdominal wound was then partly closed with catgut, making use also of three through-and-through sutures of silver wire as tension sutures and not closing the wound tightly at the lower end, with the idea of giving drainage.

The patient reacted well after the operation. There was a slight leakage of fecal matter on the third and fourth days, but none after that, and the patient returned to her home well, leaving the hospital on September 28, 1907.

Dr. Adams saw her in his office two weeks ago, and while there was considerable thickening in the vault of the vagina, yet she seemed in perfect health.

CASE II.—This case of ileovaginal fistula was operated on August 20, 1906, at St. Mary's Hospital.

The patient was thirty-three years old, mother of one living child six years old. On October 10, 1905, she had a criminal abortion performed. She was very ill after this with a very severe peritonitis, and as the result of this she was confined to her bed until the following June.

During the course of her acute peritonitis a fecal fistula developed, due, as he supposed, to abscess formation behind the uterus, establishing a communication between the small intestine and the vagina. This point could not be made perfectly clear, she claiming that it appeared directly after the attempt at abortion. There had been a profuse discharge of fluid feces, requiring at times as many as thirty napkins a day. Her weight fell from 153 to 94 pounds.

Dr. Adams first saw the patient as she was brought to the operating-room, and as she was under the anesthetic he was able to make a thorough examination. It was thought that the fistula was probably rectovaginal. Examination showed a fistulous opening in the right vaginal fornix which allowed a probe to pass for several inches; with the finger in the rectum it was demonstrated that it did not communicate with that organ.

There was some slight thickening to the right of the uterus around the site of the fistula, but with that exception the uterus and appendages were apparently normal. An abdominal section was decided upon and the abdomen opened in the median line. A loop of intestine was found firmly bound down in the cul-de-sac, extending from the median line off to the right; this was freed with some difficulty and found, on being brought up into the wound, to be the real seat of the fistula.

It was found necessary to resect about 15 cm. of intestine and the ends were brought together with a Murphy button. The fistulous opening into the vagina was enlarged and gauze drainage introduced. The abdominal wound was sewed up in layers. The patient made an uneventful recovery, the button coming away on the twelfth day.

DR. ABRAM BROTHERS was much interested in this question of how often one should operate for the various forms of fistula, and he confessed that in the last dozen years he had seen fistula occurring after operation heal spontaneously. His cases uniformly healed of their own accord. Some of these fistulae followed operation for appendicitis, some after work on the adnexa, etc. His own results had been favorable where he followed the policy of waiting. The question, therefore, arose in his mind, how often was it necessary to operate upon these post-operative fistulae?

DR. ADAMS said that where the large intestine was involved one could hardly expect to get good results by other than operative methods.

DR. LE ROY BROUN reported a case of

PREGNANCY TOXEMIA. DEAD FETUS. CICATRICIAL CERVIX.
VAGINAL CESAREAN SECTION.

The following history had been furnished him by the physician of the patient. Mrs. H., aged thirty-seven years, married, and the mother of several children, consulted him on March 22, stating that she had not menstruated since September 19, and that she had only felt life on one occasion. An examination showed the presence of a large fibroid in the fundus of the uterus associated with pregnancy, with the fetal heart 150. The urine, contained no albumin. Her temperature was normal. The mother presented no abnormal symptoms.

Dr. Broun saw the patient March 27 in consultation and recognized the presence of the fibroid as well as the seven-months pregnancy. Her scant amniotic fluid brought the fetal parts in strong relief, simulating the presence of other fibroids. Especially was this true of the head, pressing firmly in the cul-de-sac. While he regarded this presentation as the head, and so stated, yet the possibility of its being a fibroid was admitted. On account of the fleshy abdomen and the necessity of definitely determining that the labor or abortion could proceed in a normal way, anesthesia was advised

The following day the physician was sent for on account of vomiting. The condition otherwise was apparently good. Her pulse was 110 and she passed a good amount of urine. The patient was not removed to the hospital on account of the objections of the family. The vomiting continued for two days. The family yielding to the demands of her physician, she was brought to the Woman's Hospital on the morning of March 30. Dr. Broun saw her at once and found her without any radial pulse. Three ounces of urine, heavy with albumin and casts, were withdrawn by catheter.

The patient's condition precluded any anesthetic. The cervix which was hard and sclerotic was dilated sufficiently to admit a finger; beyond this no progress could be made. A bougie and bag were introduced. The patient was bled, ten ounces, and a pint of salt solution was put under each breast every two hours; also rectal irrigations with hot saline solution was kept constantly running. Within the next twelve hours she only passed three drachms of urine. Under this vigorous treatment for twelve hours, the pulse became perceptible at the wrist. She was transferred to the operating-room and the uterus was emptied by the so-called vaginal Cesarean section. The entire operation consumed only fifteen minutes. The patient passed within the next six hours five ounces of urine. Salt solution under the breasts was continued, as were also the rectal irrigations. The kidneys after this one effort ceased to act and the patient died eighteen hours after the operation.

No autopsy could be obtained. Dr. Broun, however, believed the condition to have been one of degenerative liver changes associated with some kidney lesion. He could not otherwise explain the vomiting which persisted for four days and the failure of the kidneys to respond, after the emptying of the uterus, although there was a temporary response within the first five hours after delivery.

Dr. Broun presented the fetus which had a marked spinal deformity over the lumbar vertebra.

His object in reporting this case was to accentuate the value of vaginal Cesarean section in cases requiring a rapid emptying of the uterus, when the existence of a hard sclerotic cervix rendered manual and instrumental dilatation a dangerous operation. Accouchment forcé under the existence of an unyielding cervix was risky in the extreme, being almost certain to be attended by deep tears in to the base of the broad ligament, even extending to the lower segment of the uterus, followed by a profuse hemorrhage from rupture of large vessels, which would be controlled with difficulty. Vaginal Cesarean section, in such cases, was to be preferred. It was safer, being practically devoid of danger in skilled hands and, with any one trained in operative surgery, could be performed in fifteen minutes, as in this case, or in thirty minutes at the outside.

DR. LE ROY BROUN also reported a case of

DRAINAGE AFTER RUPTURE DURING REMOVAL OF RECENT
OVARIAN ABSCESS. CULTURE STAPHYLOCOCCUS.

Mrs. S. twenty years old, married, aborted two weeks previous to entering the hospital. Following the abortion, there had been a vaginal discharge with tenderness over the lower abdomen. The local condition was one of a tuboovarian mass on the left. The left tube and ovary mass were removed, the condition being one of salpingitis with a small ovarian abscess. In the removal the abscess was ruptured in separating the adhesions. No soiling of the intestines resulted, since the field of operation was well walled off with gauze. On account of the recent occurrence of the infection, a pelvic gauze drain was introduced, isolating the site of the operation.

The patient made an ordinary recovery, with the exception of a staphylococcic infection of the abdominal wound. A culture of the abscess contents showed also staphylococci.

Dr. Broun's object in reporting this case was to bring out the fact that a certain class of cases should be drained. It was well established that a tubo-ovarian abscess of long standing was uniformly sterile. Soiling of the pelvic peritoneum with the contents of such abscesses did not require drainage. In such cases drainage was only necessary to stop oozing from a large raw surface or in order to render certain necrotic areas in the site of the old abscess extraperitoneal.

In the class of cases in which this patient belonged, in which there existed an acute tuboovarian trouble, the bacteriological activity remained for some time after the subsidence of the acute condition. In the removal of such conditions, the custom that had given him the best results was to introduce a drain whenever the pelvis had been soiled by the abscess contents.

DR. ABRAM BROTHERS said he was interested in the toxemias of pregnancy and believed, too, that every case of vaginal Cesarean section should be placed on record. He wished to report a case of vaginal Cesarean section performed about three months ago for conditions almost parallel to those presented by the patient under Dr. Broun's care. The patient was a primipara and was seven months pregnant. She was the sister of a physician. She was known to have albumin in her urine one week before operation. She was put in bed, given plenty of milk and other liquids, and placed under the best dietetic and hygienic surroundings in order to overcome the condition of toxemia. With a urinary secretion of forty ounces, she was seized with her first convulsion; this was soon followed by a second, and at midnight she had her third convulsion and with absolutely no signs of labor coming on. She had a rigid cervix and the question of slow dilatation and emptying the uterus by slow means did not appeal to him at all. Because of her condition, he did not feel justified in removing her to the hospital. He did a vaginal

Cesarean section that night. The convulsions ceased. About the third day she developed peritoneal symptoms, although the peritoneum was not opened. She went on, however, to complete recovery except for a small vesicovaginal fistula which he proposed to close in the near future.

DR. SAMUEL W. BANDLER had done three vaginal Cesarean sections, and the result in all three cases had been most gratifying, and without injury to the mothers.

DR. ARNOLD STURMDORF had one sad experience with toxemia of pregnancy. The patient was a physician, a personal friend of his, who was anxious to have offspring. She became pregnant after a slight operation. The urine was examined regularly, and absolutely nothing was found at any time. At twelve o'clock he was summoned and found Dr. Dorman doing a post-mortem Cesarean section, trying to bring a living child into the world. There was no cardiac lesion. At autopsy there were found the characteristic changes in the kidneys.

The question of pelvic drainage he did not think had been sufficiently discussed. There entered the question of the personal equation. In acute conditions, in the presence of temperature or infection in an active stage, they then should drain. But once the acute stage had subsided it made no difference whether they drained or not so far as the results were concerned. In subacute and chronic stages of suppuration the pus would seek the path of least resistance, and the introduction of gauze drainage might block the pus.

DR. WILLIAM S. STONE said that in the acute fulminating cases, whether you emptied the uterus or not, the result would be the same. Such cases were analogous to cases of putrefaction from retained gestation products, with chills, rise of temperature and the patient going on to complete convalescence. Personally, he always used ether as the anesthetic.

DR. HERMANN J. BOLDT reported a case of

UNRUPTURED TUBAL GESTATION.

Mrs. H., thirty-four years; one child in 1896. Was operated by me on September 9, 1904, for ruptured tubal gestation, complicated by peritonitis. The ruptured part of the tube was at that time tied off and the remnant with the ovary left. The right Fallopian tube was found to be in a condition of catarrhal inflammation. It was left *in situ*. Uninterrupted recovery. The patient remained in excellent health up to the present time. On March 25, she consulted me with the statement that she purposed to go to Europe with her husband in a few weeks, but having missed her period by four days she desired to know whether she was pregnant. There was no other symptoms for such belief than the four days over time. Examination showed the uterus to be a trifle softer and seemingly also a trifle enlarged, corresponding to about one week or ten days' gestation. To the right of the uterus a tubal swelling was felt which was

slightly sensitive to touch. The diagnosis was either an early intrauterine pregnancy with an acute salpingitis, or a tubal gestation with the usual accompanying change in the uterus. There being no etiological factor for a sudden acute inflammation of the tube, I leaned to the diagnosis of tubal gestation. The patient was sent home and requested to go to bed for observation. An examination three days later showed no change, except that the tubal swelling was a little more sensitive. The woman was then sent to the hospital for further observation, feeling that a few days' observation would clear the diagnosis and if it was an erroneous suspicion on my part nothing was lost. A day later, the patient began to stain and she happily exclaimed that she was menstruating and everything was all right. On the afternoon of April 1, the swelling was still more sensitive and a trifle larger; in addition, there was some pain on moving the vaginal portion of the cervix forward. On the following morning, I operated because of the certainty that was felt of the correctness of the diagnosis despite the fact that the woman had no subjective symptoms. The adhesions from the previous operation were very firm and quite diffuse, and after their separation the tube was readily brought to view, there being no adhesions. It was excised from the uterine cornu and the ovary implanted into the cornu. The remnant of the other tube was then also excised and the ovary attached into the cornu. The large appendix, which was catarrhally inflamed, was also removed.

DR. BOLDT also reported a case of

PROGRESSING TUBAL ABORTION.

In contrast to the first specimen, one of progressing tubal abortion was shown. The patient, L. F., was operated upon on the 13th inst. and had her last child five months before. She complained of irregular bleeding and severe cramp-like pain in the lower abdomen. There was also pain in the lower rectum. Examination showed a mass about three inches in diameter, somewhat elongated to the left of the uterus. The uterus was slightly softer than normal in consistency, but not appreciably enlarged. The mass was apparently tubo-ovarian and was adherent. The patient was supposed to have aborted and had been curetted, and the mass was considered to be of inflammatory nature.

On opening the abdomen, but little free blood was found present. The reason for this was shown to be because the fimbriated end of the tube was occluded by adhesions with the omentum and intestines surrounding the tube, all of which were firmly adherent, so that the hemocele was of small size, and the adhesions caused it to remain unilateral. The ovary being seriously affected, it was also removed with the impregnated tube.

Both patients were out of bed within three days after operation

DR. A. REICH presented a

FIBROID TUMOR OF THE VAGINA.

Mrs. B., twenty-three years old, married two months, presented herself on account of dyspareunia. Her first menstruation appeared at thirteen years. It was painful, of three days' duration and regular, the amount rather scanty. There was no discharge between her menstrual periods. She considered herself perfectly healthy.

On examination, the external genitals appear normal, except for a bulging of the left labium majus. The skin covering it is normal and is freely movable. The hymen is ruptured, but the introitus is obstructed by a tumor on her left side, the vaginal mucous membrane is bluish in color, but also freely movable.

The finger in the vagina can feel the growth extending almost four inches and laterally from the urethra to the rectum, taking in the entire left side of the vagina.

Above and to the right the cervix can be reached with a small anteflexed uterus, which is easily movable and in no way connected with the growth below.

An incision about two and a half inches long was made through the vaginal mucous membrane, beginning three-fourths of an inch below and to the left of the urethra on the inside of the labium minus; the capsule of the tumor opened, the growth grasped with a pair of Vosella forceps and shelled out of its bed with the aid of the handle of the scalpel and the severing of just a few stronger attachments with the scissors. There was little bleeding and the large cavity was packed loosely with gauze, the incision was closed, leaving three-fourth inch open for drainage.

In four days all the packing was removed. The opening in the vagina remained open for about three weeks—the patient left the hospital on the tenth day.

The fresh specimen weighed 530 grams. Its length is 13 cm. the largest diameter $7\frac{1}{2}$ cm. the surface is nodulated. The tumor has a distinct capsule and is a typical fibroma.

DR. ARNOLD STURMDORF reported a case of

STRANGULATED "DISSECTING" HERNIA, SIMULATING PERITUBAL SUPPURATION; EXSECTION; RECOVERY.

"Dissecting"—"properitoneal"—or interstitial hernia, as it is called, is uncommon, especially in the female.

One form, known as the "parainguinal," is presented by the present case, the hernial canal ran parallel to the inguinal canal without any anatomical relation to the inguinal rings proper; the hernial sac with its strangulated contents being fixed entirely within the layers of the abdominal parietes.

Macready reports 169 cases of interparietal hernia and Göbell has collected 280 cases, the illustrations of which may be found in the American edition of Von Bergman's Surgery.

As in the present instance, the cases are usually detected when

strangulation is present, so that it is difficult to investigate the exact conditions.

The term interparietal is applied to the cases in which the sac exists between the layers of the abdominal wall; that is, either in the loose connective tissue existing between the peritoneum and fascia transversalis or between the internal and external oblique.

The sac may spread in several directions, sustaining constrictions by fascial and muscular bands resulting in lobulation and producing the bilocular or multilocular forms of this hernia. They may attain enormous dimensions, resulting in atrophy of the abdominal muscles.

Of 115 cases collected by Göbell, 111 were in males and four in females.

The occurrence of these herniæ is attributed to a congenital diverticulum of the peritoneum escaping through abnormal ostra, resulting from embryologic imperfections in the abdominal parietes.

Mrs. F. was referred to my service March 22, 1908, by Dr. M. Rosenthal, with the diagnosis of tumor.

The patient is Russian by birth, thirty-four years of age, married eight years. Family and previous history negative.

Obstetrical History.—Patient gave normal birth to six children; had two miscarriages, one at three months and one at ten weeks; came unknown. Present illness dates one year and is supposed to have followed a curettement after the last miscarriage. Symptoms consisted of attacks of pains, with intervals of tenderness and fullness of the right side on a transverse line inward and about one inch from the anterior superior spinous process. Some constipation. Moderate leukorrhœa.

She was treated in Mt. Sinai Hospital and in its out-patient department for "Womb trouble" up to five days before admission to my service, when she was suddenly seized with an attack of pain more severe than any hitherto experienced, which was accompanied by repeated and uncontrollable vomiting and constipation.

On admission, the vomiting was marked, not fecal, the pain severe, the intestinal obstruction complete.

Her general condition was good, abdomen not much distended; temperature, 100.8; pulse, 120.

One inch to inner side of the right anterior superior iliac spine an infiltrating, resisting mass seemed to invade the abdominal parietes, covering an area of about four fingers' breadth and extending downward toward the right adnexa, which on vaginal palpation presented evidences of old infection.

Uterus fairly movable; left adnexa normal. Urine shows increased indican content, while the blood presented a leukocyte count of 23,400, with a polynuclear per cent. of 94.

The blood-findings, the history of gynecological infection, the apparent infiltration of the abdominal wall from a process that

seemed to originate in the right adnexa, suggested an old sup-puration process, with intestinal obstruction due to adhesions or inflammatory bands.

Operation, March 23. Incision directly over most prominent point of the mass. Careful dissection through the infiltrated muscles down to the transversalis fascia, splitting of which revealed a hernial sac with six inches of gangrenous ilium, constricted by an abnormal opening in the fascia, the hernia lying between this fascia and the peritoneum. The normal condition of the inguinal rings and canal was easily demonstrable. Exsection of seven inches of the involved gut with its mesentery, followed by end-to-end anastomosis, resulted in complete relief of all symptoms and uneventful recovery of the patient.

The instructive data of the case speak for themselves.

DR. HENRY P. DE FOREST reported a case of

TRUE HERMAPHRODITISM.

The individual, Miss X., was twenty-four years old, born in Philadelphia, but the family history could not be obtained. Until a few months before the accompanying photographs were made, she had been reared as a woman, had menstruated regularly and in both dress and manner of life and appearance in evening costume was generally regarded as a young woman of rather prepossessing appearance. There was no growth of hair upon the face or elsewhere upon the body, save in the pubic and axillary regions.

At this time she was living in a boarding-house in Philadelphia where there were a number of boarders, by whom it was never suspected that there was any question of her true sex. Among the other guests in this house was a man of fifty and his daughter of eighteen years of age. The man became enamored of Miss X and, overcoming her scruples, they lived together as man and wife in a surreptitious manner. She became pregnant and was ultimately delivered of a child. The exact duration of the pregnancy cannot now be ascertained.

In the meantime, the daughter of the man became a close friend of X, and they frequently shared each other's apartments. The masculine side of the patient became apparent, for X became enamored of the daughter, overcame her scruples and they, when occasion offered, lived together as man and wife. The daughter, too, became pregnant and so, in turn, was delivered of a child.

The development of the two pregnancies occurring in supposedly virtuous women led to a considerable scandal in the boarding-house, and the three took their departure as soon as the facts were actually known.

As shown in a photograph, the upper part of the body was that of a well-developed woman. The hair is long; the contour of the face, although somewhat masculine in type, still is smooth

and suggests a woman rather than a man. The breasts are large and well-developed.

The lower part of the body, on the other hand, is distinctly masculine in type. The pelvis and hips are narrow and the external genitalia are evidently, upon superficial inspection, those of a man. The penis is well-developed and the testicles are both present and of large size.

In another photograph it is shown that upon raising the penis and supporting the two halves of the divided scrotum, the vagina is exposed.

The exact condition and arrangement of the internal organs of generation can now only be conjectured; but in view of the fact that menstruation occurred regularly and that impregnation took place, there is no doubt that a uterus existed and that one or both ovaries were present and functioning. It is hoped that the subsequent history of the individual may in time be related.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

Meeting, of April 27, 1908

The President, J. RIDDLE GOFFE, M. D., in the Chair.

THE HYGIENE AND MANAGEMENT OF PREGNANCY, INCLUDING THE EXAMINATION OF THE URINE.

DR. AUSTIN FLINT, JR., read this paper, and said that he would take up this subject in a general way from the stand-point of the general practitioner and try to emphasize those points which, in his experience, were often neglected. In recent years, many important advances had been made in the management of pregnancy which were far-reaching in their results for the welfare of both the mother and child. It was not too much to say that most of the complications of labor and the puerperium could be forestalled and the dangers materially lessened by proper prophylaxis. The first point to impress on physicians generally and on the patients was the wisdom of assuming charge of the patient as soon as the diagnosis of pregnancy was made. The management of pregnancy Dr. Flint divided into three periods of three months each.

First Period.—This comprised the time from the beginning of pregnancy until the end of the third month. The ordinary rules of health should be followed. The changes in the maternal organism were so manifold and the dividing line between health and disease was so ill defined, that derangements which in the nonpregnant condition were unimportant might in the pregnant

state give rise to pathological conditions which seriously affect the health of the mother and child. Under ordinary conditions, the patient might be allowed to lead her usual life without restriction. As a rule, a pelvic examination was not necessary during this period. Slight vomiting that was limited to the morning required no treatment beyond some care in the diet and perhaps ordering some simple tonic. If the vomiting was marked and persistent, an attempt should be made to discover its origin. A convenient working rule was to recognize three distinct types: neurotic, reflex and toxemic. The most frequent and ordinary type was the neurotic and might be distinguished by the exclusion of reflex irritation and toxemia. This begins, as a rule, about the sixth week, and continues until the beginning of the fourth month. Regulation of diet and removal of the constipation, with the administration of cerium oxalate, will ordinarily improve the condition. If vomiting was persistent, a pelvic examination, as well as an examination of the urine, should always be made. The reflex type of vomiting was due to some pathological change of the pelvic organs, a backward displacement of the uterus being the most common. He believed in the good effects of dilatation of the cervix, although it was said that the good effects were often due to suggestion. In cases of erosion and laceration of the cervix, local treatment resulted satisfactorily. Ovarian cysts demanded removal and an early operation should be advised. The toxemic type was more properly termed pernicious vomiting, and this often began as an ordinary neurotic or hysterical vomiting, the patient becoming toxemic secondarily. The diagnosis was made by the results of a chemical examination of a twenty-four hour specimen of urine. In the toxemia of pregnancy there was a profound disturbance of metabolism, indicated by a diminution of the total nitrogen and a relative increase of ammonia nitrogen. Williams has shown that the "ammonia coefficient in the first half of pregnancy varies between 4 and 5 per cent., but in toxemic vomiting it rises to 10, 20 or even 30 per cent. So soon as the diagnosis of toxemic vomiting was made, the uterus should be emptied. Dr. Flint had long taught that when the vomiting was accompanied by weekly loss of weight, progressive exhaustion and failure of the usual medicinal measures, no time should be lost in emptying the uterus. The change in the nitrogen distribution in the urine was an absolute indication for early abortion, and the operation should be followed by copious enemata of saline solution and little if any food given by mouth. Gastric lavage sometimes gave great relief.

Second Period—Regular systematic examination of the urine during this period he considered the most important part of the management, and should be done every second week up to the last month, when the interval should be every week. The danger of the occurrence of eclampsia increased as pregnancy advanced, and the only way to be forewarned of danger was to insist upon regular examinations. A full diet might be allowed, interdicting

only wines and the more indigestible and richly flavored articles of food. Regular walking exercises were valuable.

Third Period.—This was the time when prophylaxis was productive of the best results and the following points should be considered. (1) Pelvic mensuration. Pelvic examination was now the routine practice and was the only way that a diagnosis of pelvic contraction could be made. The importance of this could only be appreciated when they remembered that contraction occurred in from 12 to 14 per cent. of all cases. (2) Physical examination. About six weeks before the date of confinement, the patient should be instructed to remain in bed and a physical examination should be made, including the pelvic measurements. In cases where the pelvic measurements are small, six weeks allowed ample time for interference. The size of the uterus, the quantity of amniotic fluid, and the size of the child's head should be estimated. In primiparæ especially, and in all cases where the child seemed large, good results followed a restriction of diet. When real dystocia was feared, the diet might be cut down to the smallest possible quantity in twenty-four hours. As pregnancy advanced, the relative size of the head and pelvic brim should be tested from time to time by trying to push the head down by external pressure, as per Müller's test. (3) Diet. With the object of preventing the overgrowth or full development of the child, and so preventing difficult labor, Dr. Flint said he had unquestionably obtained good results by reducing the proteids. He called attention to the work of Prochownik who applied the principles of dieting which he had previously used for the reduction of weight in adults, for the purpose of reducing the weight of children born at term; this procedure had been employed as a substitute for the induction of premature labor in cases of moderate pelvic contraction, and the results were favorable in all instances. This diet eliminated as far as possible all fluids and carbohydrates, allowing proteids and green vegetables, but these only in limited amounts. Ten to fourteen ounces of fluid during the twenty-four hours was the original allowance. This diet Dr. Flint had never strictly carried out, but had often approximated in cases where he feared a difficult delivery. He could speak well of its value in preventing oversized children, and so far had never seen any ill effects. (4) Exercise. An abundance of fresh air and walking exercise was of the greatest value. Beginning with a walk of at least half a mile during the middle period of pregnancy, the daily walks should be increased to two miles during the last two months, and this could usually be accomplished without fatigue. Nothing would favor preliminary softening of the lower uterine segment and allow the head to sink down through the pelvic brim as well as these daily walks. (5) Clothing. During the last third of pregnancy, the patient should be instructed in regard to proper clothing. An abdominal binder or corset should be worn so as to hold the uterus up, and hold the long axis of the child in the axis of the pelvic inlet. An abdomi-

nal supporter not only contributed materially to the woman's comfort, but its use was almost necessary during the time of exercise if they wished to produce a preliminary softening of the lower uterine segment. In those patients with health below par, who tire easily, and especially in those with weak pulses, moderate doses of strychnin, with small doses of quinin, should be given regularly three times a day for the last six or eight weeks. (6) Care of the breasts. When no attention was paid to the preparation of the nipples, nursing was an ordeal which was justly dreaded by the mother. Beginning about six weeks before the calculated date of confinement, the nipples should be painted over with a solution of tannic acid in glycerin every night and, at the same time, be manipulated and drawn out for a few minutes at a time. He had not seen premature uterine contractions result from such a manipulation. The clothing should not press upon the nipples. Bathing the nipples with some astringent occasionally, such as alcohol or bay rum, was also of value. (7) Examination of the urine. A regular examination of the urine should always be made, at least once a week for the first six weeks, in order to be forewarned as much as possible in regard to the ever-increasing danger of eclampsia. A large number of cases which were formerly regarded as physiological, really were pathological; toxemia was now known to be the cause of vomiting in many cases which were formerly regarded as physiological "vomiting of pregnancy." Dr. Flint then reported a case which taught a lesson, namely, the necessity of careful urinary examination, as well as physical examinations in all cases of pregnancy.

DR. RICHARD C. NORRIS, read a paper on

THE MANAGEMENT OF THE STAGES OF LABOR TO PREVENT MATERNAL DYSTOCIA.*

THE PREVENTION OF MATERNAL INFECTION.

DR. EDWIN B. CRAGIN said that the subject naturally divided itself into three periods of time: pregnancy, labor, the puerperium. The avenues of infection concerned the genital tract, on the one hand, and the breasts, on the other. Three possibilities of infection deserved careful consideration: the use of vaginal douches with unclean nozzles by the patient, marital relations during the last weeks of pregnancy with husband unclean but not infected, and marital relations during the last weeks of pregnancy with husband infected with gonorrhoea. The use of the antepartum douche by the obstetrician had been abandoned under ordinary circumstances on the ground that even with a sterile nozzle there was danger of lowering the protective power of the vaginal canal and perhaps danger of introducing infection from nonsterile vulva without to sterile vagina within. Patients should be instructed not to take vaginal douches during pregnancy save on the special order of the obstetrician and with

* See original article, page 385.

special precautions. If, during the last month of pregnancy, there was danger in vaginal examinations by the obstetrician with cleansed and disinfected hands, there certainly was danger from marital relations with husbands whose habits of cleanliness of the genital organs were far from scrupulous. From many a case of infection following labor could the history be obtained that marital relations were practised even within the last forty-eight hours preceding labor. This held good even with noninfected husbands. It held with infinitely greater force with husbands infected with gonorrhoea. If the patient was found to be infected with gonorrhoea during pregnancy, every effort should be made to cure the gonorrhoea, both for her sake and the baby's, before the onset of labor, but with this exception: while the vulva should be kept as clean as possible during the last month of pregnancy by external cleansing, the vagina should be kept a closed canal, and if entered by the sterile fingers of the obstetrician this should be as infrequent as possible consistent with accurate knowledge of the pelvic and fetal conditions. The low mortality of carefully conducted obstetric cases in the tenements showed that with vulva and surrounding parts clean and doctor's fingers and instruments clean, results might be obtained which compared favorably with the statistics of their best maternity hospitals. The methods of chief importance, then, were: (a) the preparation of the vulva; (b) the preparation of the doctor. The three essentials to a clean vulvar field were an empty rectum, a closely-clipped, or shaven vulva and a vulva well cleansed with a clean soap and water, the direction of the cleansing being from mons to anus. The use of sterile rubber gloves was now so universal and their advantages so well recognized, that the doctor might regard himself culpable if he did not avail himself of this additional safeguard against infection. Vaginal examination should be made as infrequently as was consistent with the knowledge of the conditions and progress of the case, and the external manipulation through the abdomen should be practised until knowledge thus gained would make frequent vaginal examinations unnecessary. Recognizing the fact that the vagina was usually more sterile than the vulva, great care should be taken that when making a vaginal examination, the labia should be separated with the fingers of one hand so that the introduction of the fingers of the other hand passes directly into the vagina without carrying infection by contact with the nonsterile vulva to sterile vagina. If meddling midwifery was bad, neglected midwifery was equally bad, and experience taught that if maternal infection was to be avoided delivery should also be aided before the strength and tissue resistance of the patient were exhausted. The presence of organic material, such as portions of placenta, membranes, and blood-clots within the uterus so favored the development of a sapremia and perhaps a septicemia that Dr. Cragin said he desired to emphasize the importance of determining at the time of labor:

(1) that the placenta and membranes had been completely expelled; (2) that the uterus remained so contracted that blood-clots could not accumulate within it. The first object was gained by waiting a sufficient time for the uterus to regain tone before expressing the placenta. This period of waiting at the Sloane Maternity was fixed at twenty minutes from the birth of the child and during this time the fundus was gently held in the palm of the nurse or doctor with just manipulation enough to prevent ballooning. As soon as the placenta and membranes were expelled they should be examined carefully to ascertain if they were complete, and if this examination showed the absence of any large portion of either, he believed that infection was avoided by carefully entering the uterus with the sterile-gloved hand and removing the retained portions. Regarding the use of the post-partum douche, he believed that greater safety lay in its omission, save for two special indications—checking hemorrhage and washing away débris that had been loosened by the fingers. In these cases the greatest care should be observed in having syringe, nozzle and solution absolutely sterile. To maintain the contraction of the uterus, there were two measures at command—the administration of ergot and the gentle holding of the fundus until an hour had elapsed since the birth of the child. He believed the use of ergot had a special value as a supplement to, but not as a substitute for the holding of the fundus. With regard to the repair of the lacerated cervix at the time of delivery, he had seen within the last few years several cases of infection that seemed to be directly traceable to this operation, with its increased manipulation in the vagina and with its interference with uterine drainage resulting from a too great closure of the cervical canal. It was a good rule to suture a lacerated cervix immediately after labor only where there was excessive hemorrhage. The need of carefully sterilizing the catheter was well recognized, but the ease with which a sterile catheter could wipe off infective material from the vulva and carry it into the bladder seemed to be often overlooked in practice, even if it was known in theory. The only safe way to introduce a catheter in the female was, with labia separated and meatus well exposed and cleansed, to pass the catheter directly into the meatus without touching the surrounding parts.

One of the occasional causes of infection in the second week was a stenosis of the canal of the uterus with retention of lochia resulting from a flexion of the uterus. While this was more common with an antelexion than a retroflexion, still it might occur with the latter, and this tendency to a posterior displacement of the uterus should be warned against by having the patient after the fifth day keep off the back for a considerable period each day, lying for a time on one side, then prone and then on the other side. It was also of value, unless otherwise contraindicated, to favor drainage by having the patient, after the fifth day, use the commode at least once a day. The prevention of breast infection

during lactation depended upon the care of the nipples during pregnancy and the care of the breasts and nipples during the puerperium. This implied cleanliness and keeping the nipples free from the crusts which were apt to form as the breasts began to secrete. The nipples should be bathed night and morning with a saturated solution of borax in 50 per cent. alcohol. If the nipples were retracted, easy nursing and ready emptying of the ducts was favored by having the patient, during the last weeks of pregnancy, gently draw out the nipples with clean fingers at the time she bathes with the borax and alcohol solution. The care of the breasts and nipples during the puerperium implied cleanliness, support and free drainage. In carrying out these indications three propositions should be considered. (1) Lack of cleanliness favored infection, even with sound nipples, and more so with nipples which were cracked or abraded; (2) overdistended milk-ducts easily became inflamed and infected, especially if the nipples were not sound and clean; (3) sagging of the breasts during lactation favored overdistension and therefore infection. The prophylactic treatment consisted in support of the breasts by a properly fitting binder, massage of the breasts if the ducts showed a tendency to become overdistended, cleanliness of the nipples and the baby's mouth, the prevention of cracks and abrasions as far as was possible, and the healing of them as soon as possible if they occurred. In order to prevent abrasions of the nipple, the baby should not be allowed to remain at the breast longer than five minutes every four hours and only in the day time, until the milk was secreted. Between the nursings the nipple should be covered with a piece of sterile lint smeared with alcohol. For the healing of cracks and abrasions the application of 8 per cent. nitrate of silver solution, followed for a short time by the use of a sterile nipple shield had proven valuable in his hands. If the nipple continued to be tender and nursing painful, applications of the glycerol of tannin would usually give relief. If mastitis threatened, the breasts should be emptied, the bowels emptied, and ice should be applied to the breasts.

THE PREVENTION OF FETAL INFECTION, EYES, MOUTH, UMBILICUS.

DR. J. CLIFTON EDGAR read this paper. The prevention of infection by careful cleansing of the mouth immediately after the delivery of the head was often overlooked. Cleansing of the infant's mouth at this time was especially called for after delayed or tedious labor and in instances of gonococcus vaginitis in the mother. In the former case, by reason of the prolonged labor, not only do the vaginal secretions undergo changes, but an antepartum subaeration of the fetal blood, or asphyxia neonatorum, caused attempts at respiration on the part of the fetus within the birth-canal, with a consequent aspiration of maternal secretions into its mouth and pharynx. Hence the importance of mouth cleansing. It was his belief that there was no especial

value in chemical antiseptics for this purpose, but their aim should be to mechanically remove the foreign substances as thoroughly and at the same time as gently as possible. Roughness and carelessness in this connection only defeated their aims by causing abrasions of the delicate buccal mucous membrane, and thus predisposing to subsequent infection. Immediately upon the delivery of the head and even before the eyelids were cleansed, the lips and nose were wiped free from mucus and foreign substances, and then the small finger wrapped with a piece of gauze, or better clean old linen dipped in a boric acid solution, or plain water, was passed into the child's mouth and any accumulated mucus, blood or meconium removed by an outward sweep of the finger in each cheek.

Each eye-lid of the infant should be carefully cleansed by means of a piece of old linen and sterile water or boric acid solution. A separate wipe should be used for each eye, and the lids gently washed from the nose outward. Ophthalmia neonatorum produced from 7 to 10 per cent. of the existing blindness to-day, and only recently Mr. Simon Snell reported that of 333 inmates of the Sheffield School for the Blind, 136, or 42.36 per cent., had been blinded by ophthalmia neonatorum. Among the children registered in the New York State School for the Blind during the past four years, 26 per cent. had their blindness assigned to ophthalmia neonatorum. The midwife was largely responsible for these amazing figures. The gonococcus was found to be the cause of the infection in 60 per cent. of the cases. If, at the time of birth and before the eyes are opened, the lids are carefully and gently cleansed from within outward with gauze or absorbent cotton moistened in sterile water, and a separate wipe was used for each eye, and if subsequently in greasing or washing the child's body, pyogenic germs were not conveyed from the body to the eyes, ophthalmia neonatorum was reduced to a very small percentage. If this was supplemented with a drop of a solution of one of the silver salts dropped on the cornea of each eye, the vitality of the gonococcus that had escaped the cleansing and found entrance between the lids was destroyed, and the chances of the eyes' escaping infection were raised to the highest point. Which silver salt to use and in what percentage were still debatable questions. During the past few years, Dr. Edgar said he had done much clinical experimentation with the various percentages of silver nitrate, argyrol and protargol, and he believed that much was yet to be learned concerning their use. During this time he had experimented in institution work and private practice with seven different silver salt solutions, namely, nitrate of silver, 2 per cent., 1 per cent. and 5 per cent.; protargol, 5 per cent.; argyrol, 10 per cent., 20 per cent. and 25 per cent. This last solution he was now using at the Manhattan Maternity and the Emergency Hospitals. Dr. Edgar believed that a solution of nitrate of silver of proper strength and correct application would guard the baby's eyes from infection.

The death of infants early in their lives without assignable cause should always make one suspect infection through the umbilical vessels, resulting in purulent thrombi of the intra-abdominal portions of the vessels. The protection of the infant from umbilical infection demanded the following conditions: That the cord be handled only with clean hands; that sterile ligature and scissors be used in the ligation and cutting of the cord; that the raw stump be immediately covered with a piece of sterile gauze and the infant wrapped in a sterile towel, or at least in a freshly laundered one, until such time as the third stage of labor was completed, a permanent umbilical dressing could be applied; that a lubricant, and not a tub bath, be used for the first cleansing of the child and the removal of the vernix caseosa; that subsequent cleansing of the infant be by sponging, and not tubbing, until the umbilical wound had healed; that a permanent aseptic umbilical dressing be applied at birth, which should remain if possible undisturbed until the stump of the cord should separate. As used in the tenement-house service, the umbilical dressing consisted: (1) of a flannel abdominal binder, thirty inches long by six inches wide, which was intended in the average case to surround the infant's abdomen two and a half times; (2) a gauze dressing of four folds of gauze, three inches square, with the edges turned in and split from one edge to the center; (3) two small safety pins; (4) two pieces of narrow bobbin tape; (5) a small gauze wipe for the stump; (6) a pair of blunt-pointed scissors. Their routine was to tie the cord with as little traumatism as possible, and after the baby had been greased with sterile lanolin and the vernix caseosa removed as thoroughly as possible the stump of the umbilical cord was placed in the split gauze dressing and the latter folded carefully over the stump; the binder was then applied and held in place by two safety pins. Unless the binder became soiled, it was left in place until the fifth day. In a series of 1600 infants in this hospital, including 1000 cases in the East Side tenement houses and 600 in the hospital building, treated by this method, as far as was known there had not been a single case of umbilical infection. Of these 1600 cases the average time of separation of the umbilical stump was the sixth day.

DR. WILLIAM S. STONE believed that the men who devoted themselves exclusively to the practice of obstetrics could be counted upon the fingers of the two hands, and probably the supply equalled the demand; there did not seem to be any demand for more. Consultation work in obstetrics was largely emergency work and was limited to the latter part of labor largely or to puerperal sepsis. Consultation for the consideration of conditions occurring during labor had a limited demand. Outside of the occurrence of convulsions it was not considered necessary to consult one. Dr. Stone said he wished to call attention to one or two points. While it was recognized that eclampsia was a dangerous condition, yet if the patients died in most instances they

died after all had been done for them that could be done. But there were a number of cases constantly occurring in New York and elsewhere in which a normal woman gave birth to an eight and a half, or nine or ten pound baby, and dying after a prolonged forceps operation, and these were the cases which every one regretted because they could not see how they were going to prevent them. Three, four or five years ago Dr. Stone started a study of the relative size of the fetal head and the pelvis, and he learned that either by palpation or actual measurement by the so-called suprapubic pressure method, that he could tell with great accuracy the relative size of the fetal head and the pelvis. This method of determining whether or not the head could go through a given pelvis, whether he spoke of it in public or in private, was treated with indifference by his colleagues. Since then he had limited his consideration of the subject to its actual demonstration upon a few patients. This subject he believed to be worthy of more consideration; he thoroughly believed that there was no excuse for a woman to give birth to an eight and a half, nine or nine and a half pound child, and the child to be born dead. The determining the relative size of the fetal head and the pelvis would be of great aid to them.

DR. RALPH H. POMEROY, Brooklyn (by invitation), said that the Pomeroy bags must be used with great discretion because of their great dynamic force; doctors should not be encouraged to use them indiscriminately; they could not be used without danger of lacerating the cervix. Dr. Pomeroy said that as long as the general practitioner expected to do obstetric work, the family would expect the obstetric work to be done by the general practitioner, and if there was any fault to be found with this arrangement, the fault was not with the family, but with the family doctor. The general practitioner erred in not considering his own pocket-book sufficiently and would not call for a consultation early enough to benefit the patient. The more one contemplated that fact that writers, speakers and teachers in obstetric work were practically, as they grew older, developing into gynecological surgeons, one therefore realized what a difficult situation the teachers occupied in this matter. With regard to expressing the placenta, personally he favored expressing it, not after one-half an hour's waiting, but with the first possible reasonable contraction one could get, whether the patient was under an anesthetic or not. Detachment of the placenta occurred; if it was detachable, with uterine contraction. In every case in which he had to enter the uterine cavity to extract the placenta, the interference with its expulsion was almost always due to retraction of the contraction ring, and not to any attachment of the placenta. One of the meanest hemorrhages met with in consultation was the concealed one, in which there was a relaxed uterus and an unexpelled placenta.

DR. GEORGE L. BRODHEAD emphasized the great importance of the constant observation of these patients, the regulation of the

diet and the frequent examination of the urine, as well as insisting upon the advantages of exercise up to the very day of confinement, if possible. He was sure that many cases of dystocia, due to large fetus, especially where the pelvis was small, could have been avoided if the patient had been instructed in regard to her diet. Dr. Norris had brought out an interesting point with regard to copolamin; Dr. Brohead said he had used it many times, but the results were not encouraging; chloral and morphin gave better results in his hands. No greater advance had been made in obstetrics than by the use of the dilating bags, and Dr. Brodhead said he had gotten excellent results in many cases with the De Ribes bag. The use of the dilating bags had come to stay and they should be used more often than they were. He agreed with Dr. Cragin that the more external examinations were made, and the less frequent the internal, the fewer cases of sepsis. With regard to the treatment of retained membranes, for the past twelve years he had not entered the uterus to remove them. One could not be sure that he was not introducing germs when the uterus was entered for the removal of small pieces of membrane. He believed that it made no difference whether they used a 1 per cent. solution of nitrate of silver, or a 25 per cent. solution of argyrol; either would give good results in the care of the baby's eyes.

DR. JOHN O. POLAK, of Brooklyn (by invitation), believed that not sufficient attention was given by the general practitioner to the prevention of fetal mortality, and there was probably no class of work where the life of the individual, such as the child's life, was considered with less weight as in obstetric practice, and this was probably due to two reasons: First, the woman did not come under observation early enough, and even when the woman did, the practitioner was careless in determining the child's growth. Second, there was a prejudicial influence upon the practitioner's judgment as to the best procedure in the interest of the child. Tardy management was bad. It was well to recognize early malpositions, especially the occipito-posterior positions, which were frequently overlooked, and so jeopardized the lives of the children.

With regard to the repair of lacerated cervixes, he wished to enter a protest against the repair at the time of labor in the general practitioner's hands. Dr. Polak never repaired a lacerated cervix immediately after delivery except in the case of hemorrhage.

With regard to the nipples, the use of boroglycerid solution had been a crack-saver for him.

With regard to the use of ergot, he had gone through the period where he had used it, discarded it, and used it again; he now used it after labors, because it retracted and contracted the uterus and so tended to prevent septic absorption.

DR. W. GILL WYLIE believed that a good gynecologist should be a good obstetrician; these two could not be well separated.

The most important part of a woman's life was the time when she had her first baby. Surgical principles should be applied in obstetric work, the same as after important operations, such as a hysterectomy.

DR. A. ERNEST GALLANT illustrated a method he had used during the past fifteen years to keep the navel aseptic. The navel should be treated as a surgical wound was treated. With the application of the dressing he presented, there should never occur any jaundice or infection. In 1900, a series of cases were taken and subjected to experimentation; every other case was treated with the dressing applied; the others were treated in the ordinary way. In not one of the cases treated with the dressing did any jaundice or infection occur.

DR. J. MILTON MABBOT emphasized the importance of always warning the woman to keep her hands away from her vulva during the first few days after delivery. He reported the case of a woman who had been under his care and who said she had examined herself within twenty-four hours after delivery to learn how different she was then than before; she developed a pyemia and died as the result.

He was strongly of the opinion that massage of the breasts in mastitis was an injurious procedure. It was not indicated except to express the milk; it was not any more indicated than was massage of the parotid gland in mumps.

DR. RICHARD C. NORRIS, of Philadelphia (by invitation), said that they were consulted in emergency work for conditions that most often called for the rapid evacuation of the uterus; these were cases of uneffaced cervix, the lower segment of the uterus unopened, the cervix elongated, the woman comatose or eclamptic, or in convulsions, etc.; these were the conditions met with which required the rapid emptying of the uterus. With regard to the amount of time consumed in dilating with the Pomeroy bag, it should be borne in mind that this was a slow procedure, especially in primiparæ. After dilating the cervix to about 8 cm., he then introduced the Pomeroy bag and in about thirty minutes the entire birth-canal would be dilated and the child extracted with forceps without laceration. In the ordinary cases one, two or three hours may be consumed in this dilatation, if it was to be a safe procedure.

DR. EDWIN B. CRAGIN, in closing the discussion, said he wished to call attention to the fact that he said he advised massage of the breasts when mastitis threatened. There were many cases in which the breasts were distended, the ducts not being freely opened, in which massage would empty the breasts, opening the ducts so that the discharge would be free.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of April 3, 1908.

The President, I. S. STONE, M. D., in the Chair.

DR. ADAMS commenting on the minutes of the last meeting, read a letter from Mount Sinai Hospital, giving the statistics of cerebrospinal meningitis for the past eight years, with a mortality of about 50 per cent., cases in children under two years being much more fatal than those in children over two years of age. He reported a comment from Dr. Koplik saying that lumbar puncture as a therapeutic measure had not been discarded, but was perhaps as effective as the more recent serum treatment.

DR. ABBE called attention to the statistics of the short period when he saw the cerebrospinal meningitis cases at Mount Sinai, during which there were six cases all treated practically only by lumbar puncture, of which five got well and one died. It was on the impression left by seeing those cases that he had made his statement at the previous meeting.

DR. STONE presented a

FIBROID UTERUS COMPLICATED BY PREGNANCY.

The tumor consisted of a large mass of myomata of varying sizes which he had recently removed from a woman six weeks pregnant. The uterus was entirely hidden from view by the surrounding nodular masses. The patient was about thirty years of age and had been married less than six months. She had been subjected to a conservative myomectomy four years previously, and declared that she did not know of this tumor when she married. There was but little doubt about the existence of pregnancy when we met her family physician in consultation a short time prior to the operation, which was done eight days since. We found a most complicated and difficult problem facing us when the abdomen was opened. The transverse colon was adherent to the growth and all of the omentum was sacrificed in its removal. The adnexa were firmly adherent and, as may be observed, hopelessly diseased. The bladder was not only attached to the uterus and tumor, but strongly and firmly adherent over the entire superior and lateral surfaces. As may be seen, the entire uterus was removed, save a rim of cervical tissue. The specimen is presented mainly to show the presence of the fetal membranes and contents, and also to show how the most decided changes in the uterus itself as well as the endometrium may not prove a hindrance to impregnation.

DR. TABER JOHNSON thought the specimen was interesting as showing why myomectomy, which a few years ago was

thought so valuable, was now considered so rarely of use, in that it did not avert the final hysterectomy, left behind the dangers of pregnancy and abortion and made the secondary hysterectomy more difficult by increasing the adhesions. He thought myomectomy rarely justifiable if hysterectomy could be considered.

DR. KELLEY asked if myomectomy could be classed among the group of conservative surgical procedures as many of the partial operations that he did not believe in were called. Four years ago he had done one myomectomy. Since which time that patient had had four miscarriages and now is begging for a hysterectomy.

DR. CARR did not believe in so-called conservative surgery and no longer left little bits of organs which he had frequently been obliged to take out later.

DR. STONE said that at the first operation he had assisted, but that his judgment had not been asked or followed. He did not consider that any two men would agree in many cases as to just how much to remove, but that he was in favor of true conservative surgery. In this particular instance the woman had after the first operation gained a husband who was a blessing to her, but whom she might not have gained if a primary hysterectomy had been done, there being few men or women who would care to enter wedlock facing the absolute certainty of sterility. Moreover, in other cases good results and childbearing have followed conservative surgery.

DR. SHANDS read a paper on

FRACTURES INVOLVING THE ELBOW IN CHILDREN.

DR. WHITE, in opening the discussion, said that he considered Dr. Shands' position a distinct advance in that it classified the condition as one of the fractures of childhood and also in advocating operation as routine treatment. Frequently, loss of function of the forearm and deformity followed improper treatment. He considered operation on these cases attended by great risk and thought that *x-ray* examination before for diagnosis and after operation to determine the result of the operation as very important. He considered the ischemic paralysis as not benefited by any form of treatment. He thought that we were approaching the wire age in bone surgery.

DR. WELLINGTON did not consider operative treatment necessary in the majority of cases, especially if the bone was examined under the *x-rays* and reduction made under an anesthetic. He wished to emphasize the importance of the acute angle flexion in maintaining the fragment in position. He considered the ischemic paralysis as due to the splints rather than the injury.

DR. BALLOCH said that Dr. Shands' paper did not show that operative treatment was the routine in the majority of the early cases, but only for the compound fractures or the irreducible ones. He considered the *x-rays* more valuable in showing the

result of treatment than in diagnosis. He thought that adhesive strapping was more satisfactory than plaster in maintaining the acute angle. He said that ischemic paralysis was not due entirely to the splints, as it occurred in some cases that had never been treated. That anemia was a great factor in its causation. That pathological examination of the tissues involved showed degeneration of the nerve and muscle and, therefore, the shortening of both bones as recommended by some men was not beneficial.

DR. THOMAS asked if the presence of the drill in the bone had any bad effect on the bone marrow and if the repeated administrations of chloroform had any deleterious effect on the kidneys and liver.

DR. SHANDS, in closing, said that he had seen no bad effects from either drill or repeated anesthetization. That of the nineteen cases reported he had operated on seven and most of those late, that the plaster as he applied it was loose and split at a very early date. That in one of the three cases of ischemic paralysis there had been present no radial pulse.

Meeting of April 17, 1908.

The President, I. S. STONE, M. D., in the Chair.

DR. STONE presented for examination a patient upon whom he had done a radical Wertheim operation for the removal of cancer of the uterus three years ago.

The patient had recently returned with recurrence in the right broad ligament and a right movable kidney.

DR. MILLER made a vaginal examination of the patient and reported the vagina free from growth, as were also bladder and the left side of the pelvis. On the right side, there was a mass the size of an egg involving the broad ligament and perhaps the bladder.

DR. SPRIGG examined the abdomen and reported that the right kidney was freely movable, its upper pole being easily palpated, the size of the kidney apparently normal, the surface was smooth. The stomach was apparently normal, as was also the liver.

DR. BALLOCH, on questioning the patient, found that she passed little urine during the day, but that on lying down the quantity was much increased. These symptoms, together with the examination, seemed to him sufficient to make the diagnosis of hydronephrosis.

DR. STONE had made the diagnosis of intermittent hydronephrosis due to obstruction of the ureter by recurrence of the cancer around the ureter, and that he did not think there were any recurrences in the upper abdomen.

DR. SOTHORON read a paper on

HOUR-GLASS CONTRACTION OF THE UTERUS DURING LABOR.*

*See original article, page 457.

DR. MILLER said that contraction of the uterus in hour-glass shape before the delivery of the child was rare and should be treated by giving chloroform and delivering the child. Contraction in the third stage was more common. He had seen one case of twin pregnancy in which the second child was not delivered until twenty-four hours after the first. Six hours later, the placenta not having been delivered, examination showed a contraction of the uterus at Bandl's ring, which was so tight that it had to be dilated under chloroform before the placenta could be delivered. He had found hour-glass contraction of the uterus fairly common after incomplete abortion, the fundus being contracted and the lower uterine segment dilated.

DR. ALLEN of Baltimore, thought the condition rare. One of the most common causes was obstruction to the labor, continued contractions and retraction of the uterine muscle. The fundus and body of the uterus contained much more muscle tissue than the cervix, which was mostly fibrous and elastic tissue. The ring of Bandl was not a fixed point, but at the margin of the contracting portion of the uterus, and it ascended as the uterus continued to contract. Eventually, it might reach the level of the umbilicus, and at that point the danger of rupture increased greatly. In some cases marked retraction continued until the uterus seemed to fit on the fetus like a cap. The condition of contraction of the cervix was common, but this was not a true hour-glass contraction of the uterus. He had seen several cases of fetal retention due to hour-glass contraction of the uterus, which was followed by expulsion of the fetus into the thin lower segment of the uterus and rupture of the uterus. The contracted upper segment closes on the placenta and then the contraction and the rupture are recognized.

DR. TABER JOHNSON said that he had seen only two cases, and in both of these there had been a mistake in the diagnosis. In one there had been a tedious labor with the application of the forceps which brought down the uterus contracted on the fetus. The woman had been given ether, and the hand introduced into the uterus to dilate it. The second case had been diagnosed as rupture of the uterus because the contraction was so tight that it felt as though the fetus was separated in part from the main mass of the uterus. This contraction ring was so tight that even with the hand in the uterus it seemed as if the hand were going into another cavity from that in the uterus. He thought that in general the hour-glass contraction was due to meddling and stimulation of a zone of uterus below the fundus, especially in the third stage.

DR. STONE had seen two cases where the cord had been pulled off the placenta in attempting to extract it and other cases due to ergot. He asked if any cases had been seen where recurrent hour-glass contraction had occurred in successive pregnancies

Meeting of May 1, 1908.

The President, I. S. STONE, M. D., in the Chair.

DR. GRASTY read a paper on

REFLEX NEUROSES IN CHILDREN.*

DR. LOREN JOHNSON agreed with Dr. Grasty that one of the underlying causes of these reflex neuroses was rickets. Another very common cause was the presence of adenoids. Frequently, on the removal of these growths, the bad boy of the school became one of the brightest. All backward children should be given a thorough physical examination, with special care given to the naso-pharynx. He did not think that the eruption of the teeth was a cause of convulsions, but that the tooth-cutting might upset the general system and cause considerable constitutional disturbance. He drew attention to the existence in children of neurasthenia due to heredity. In treatment he emphasized the importance of sleep, and the fallacy of keeping the child awake in the day so that he would sleep longer at night. He believed that the inability to sleep at night was due to over-exhaustion of the nervous system and that the day sleep was necessary to increase the night's rest; and that sleep whenever possible was desirable. He laid stress upon out-door life when it was quiet and not associated with excitement.

DR. CARR thought that a healthy nervous system was a great aid in preventing all diseases. The eruption of the teeth or any prolonged irritation tended to upset the balance of the child's central nervous system which normally was easily upset. All sources of continued irritation should be removed.

DR. MAGRUDER considered congenital syphilis a very important factor in the causation of neuroses of children. Phimosis and adherent clitoris were still as important as they had been twenty years ago when he had read a paper calling attention to them and to the many cases of night-terrors that were cured by removal of adhesions or circumcision.

DR. TABER JOHNSON said the health of the nation was dependent upon the health of the children. One of the most important factors in the health of the child was the pure air of the country, not the mere out-door life of the city walk. Nervousness and peevishness were frequently associated with teething and relieved by cutting the gums. In two cases of his own there were positive reflexes of teething, the cough appearing a few days before the teeth and clearing up as soon as the teeth appeared.

DR. MORGAN said that certain cases of choreic manifestations, associated with a heart murmur, that cleared up with no treatment other than rest in bed and fresh air, were reflexes caused by the tachycardia. He thought that many cases of stuttering and stammering were reflexes primarily dependent on deficient nutrition and that they improved with the condition of

* See original artical page 536.

the blood. He believed in reflexes from the teeth and lanced the gums of some children. He also recognized a reflex ear cough.

DR. COOK did not believe in dentition as a cause of disease. The association between dentition and the second summer was a false one as the second winter caused no such reflex stomach troubles. The second summer troubles were due to diet, not to teeth. *A priori* the eruption of the teeth was not a reasonable source of trouble. The second teeth erode the first teeth without producing any symptoms similar to those associated with the cutting of the first set of teeth. A moderate gingivitis does occur with the cutting of the teeth, but the fact that the tooth is seen under the gum attracts attention, and to it are ascribed all the troubles occurring at about that period.

He did not think there was any analogy between the cutting of the wisdom-teeth and the cutting of the baby-teeth, as the wisdom-teeth appeared when the mouth was already full of teeth and frequently the wisdom-teeth had to come in at an angle or interfere with other teeth.

DR. ACKER said that he did not think that reflex neuroses occurred in healthy babies, but only in those with unhealthy parents or bad bringing up.

He cited the instance of one child who vomited repeatedly in the presence of its father and was cured only when sent away from its parents. This he considered a reflex vomiting due to the irritation of the presence of the parent. The central nervous system was frequently involved in rickets. He thought dentition a cause of disease, but not a predisposing cause. There were troubles of the second winter due to dentition just as well as the troubles of the second summer. In winter, there were bronchitis and pneumonic conditions with fever, but of atypical course, all symptoms disappearing as soon as the teeth were cut.

In some children there were local spasmodic tics following grippe which disappeared with increased good health. He thought Dr. Morgan's cases were not true chorea, but reflex tics.

DR. COOK asked why the eruption of the teeth should cause diarrhea in summer and pneumonia in winter.

DR. WALL agreed with Dr. Cook that the season rather than the cutting of the teeth was the cause of any serious constitutional disturbance.

DR. THOMAS thought there were many reflex neuroses due to absorption from the alimentary canal and other intoxications.

DR. ADAMS had never seen a case in which he was satisfied that the eruption of the tooth was the cause of the disease, but that in every case he had been able to find some other cause which was more effective than the tooth.

DR. TABER JOHNSON asked whether it was possible to show that Dr. Adams' possible cause of the diseases was the true cause rather than the tooth cutting.

DR. GRASY believed dentition to be a cause of reflex neuroses when the child's central nervous system was already below par

Meeting of May 15, 1908.

The President, I. S. STONE, M. D., in the Chair.

DR. CHARLES S. WHITE reported a case of

RUPTURE AND COMPLETE INVERSION OF THE UTERUS.

Mrs. K., F. W., twenty-eight years, IV-para.

Previous history obscure and unknown, except that her physical condition was poor, she being a stout woman who took the minimum of exercise and the maximum of alcoholic stimulants compatible with her occupation as a prostitute. I have no knowledge of an examination made prior to labor.

Pains began on the night of March 27, and by 11.30 A.M. of the following day, were strong and regular. A diagnosis of transverse presentation was made after a vaginal examination. Her temperature at this time was 102; pulse, 120. She was anesthetized and at 12.30 version was performed and a full-term child delivered, which to all appearances had been dead a few days. There was insignificant hemorrhage during this procedure. The placenta could not be expressed by the Cr  d   method, and an effort was made to remove it by introducing the hand into the uterus. Traction upon the placenta completely inverted the uterus and exposed a linear laceration posteriorly from the cervix nearly to the fundus, or about eight inches (20 cm.) in length.

It was at this time that I first saw the patient, about 2.30 P.M. The placenta was attached to an inverted uterus, with bandages compressing the cervix as a tourniquet, she was already anesthetized, and salt solution was being introduced into the vein. The pulse was soft and between 140 and 150. The external bleeding was not copious. The placenta was removed at once, the uterus washed with 1-5000 bichlorid, followed by salt solution. A long median abdominal incision was made and about 1000 c.c. of blood removed, partially clotted. An assistant returned the uterus to its normal position by steady pressure from below, compressing the uterus at the same time. The laceration was then dealt with through the abdominal incision. It extended through all the coats, and the peritoneum, in addition to being torn, was stripped back one to two inches on either side of the rent in the muscle. The walls were sewed with two layers of chromic gut and the abdomen closed with drainage, consuming in all about twenty minutes. She died shortly after she was returned to her room.

There is very little doubt but that the rupture occurred coincident with the version, attended with hemorrhage and collapse, and that the inversion was produced in efforts to remove the placenta, aided by the rupture and relaxation. I was impressed with the friability of the abdominal muscles when the section was made and believe that the same condition of the musculature of the uterus was present, perhaps superinduced by

attacks of endometritis which is almost a constant condition in prostitutes.

A question which gave me most concern was the choice of operation, vaginal hysterectomy or laparotomy, and I am free to admit that this doubt still lingers. In the majority of cases which succumb to rupture of the uterus, peritonitis is the cause and it was with the object of reducing this element of danger that the abdominal route was selected. The laceration extended so far into the cervix that perfect control of hemorrhage might have required equally as long as a laparotomy, without the additional advantage of giving the opportunity to remove blood (probably infected) from the abdominal cavity.

A hasty survey of the literature plainly indicates that rupture and inversion alone are uncommon, while the combined condition has not come to my attention. The frequency of either varies according to the authority, from 1 in 482 labors to 1 in 4429.

Many cases of rupture of the uterus have been overlooked, even in maternity hospitals, as the hemorrhage may be gradual or entirely intraperitoneal—so-called concealed hemorrhage. The mortality of rupture alone is variously stated, ranging from 90 per cent. of some years ago to about 50 per cent. at the present day. Authorities differ radically in methods of treatment, namely, tamponade by some, suture of the uterus by others and hysterectomy by the less conservative.

DR. KELLEY did not quite understand whether the cause of the rupture of the uterus was the manner of the version in this particular case or whether any version would have produced the same result in this uterus. He had seen one case with only a scar for an os, in which death from rupture of the uterus followed an not unduly prolonged labor. In another case a patient had been brought to him twenty-four hours after labor with the intestines protruding through the rent in the anterior uterine wall. The intestines were already gangrenous. This patient also had died from the combination of shock of the labor, rupture of the uterus and the subsequent laparotomy for the intestinal condition.

DR. BALLOCH asked what evidences there were of friable muscles.

DR. MILLER reported a case of rupture of the uterus into the broad ligament which had not been sewed up, but the woman got well, and another with intestinal resection that died.

DR. WHITE said that there had been no gross evidences of syphilis, but that the abdominal and uterine muscles were extremely friable.

DR. MORSE read a paper on

SYPHILIS IN PREGNANCY AND EARLY INFANCY.*

DR. WALL said that with careful technic the *treponema pallida* had been found in all stages of syphilis and observed pass-

* See original article page 540.

ing through the placenta to the mother or to the child. He had observed hollow anterior molar second teeth with cauliflower conformation of the dentin which was just as characteristic as the Hutchinson teeth.

DR. ADAMS said that twenty years ago he had presented a case of syphilis of the placenta in which neither parent presented any sign of syphilis nor had they since developed any signs though they had not had any antiluetic treatment. The mother had not been pregnant since. That child had died at birth from a short cord wrapped around the neck.

DR. COOK asked if there was any explanation of the apparently opposite conditions produced by syphilis, adherent placenta and abortion.

DR. MILLER asked if there was any proof that the treponema was present in the spermatic fluid in the cases in which the mother was supposed not to be infected.

DR. WHITE said that the organism had been found in the congenital cases in lungs and spleen and swarming in the liver.

DR. DONNALLY said that the treponema had been very easily demonstrated in the primary lesion by excising a portion of the sore, fixing in 10 per cent. formalin, impregnating with 1 per cent. silver nitrate in diffuse daylight for three days and then sectioning. Examining in the fresh state, they could be shown in a smear of scrapings by transverse illumination.

DR. VAUGHAN said that since the mode of infection of syphilis had been clearly demonstrated the disease ought to be amenable to excision with the adjoining lymph-glands if necessary at early stages.

DR. ADAMS had known one case where the woman had had syphilitic children, and yet in twelve years had shown no signs of syphilis.

DR. COOK said that if it was possible for syphilis to be communicated by the spermatozoa the treponema must be extremely numerous or have a special affinity for spermatozoa.

DR. MORSE, in closing, said that the adherent placenta was due to endometritis, and abortion to the death of the fetus, so that they were not incompatible.

REVIEW.

DISEASES OF THE BREAST, *With Special Reference to Cancer.*

BY WILLIAM L. RODMAN, M. D., LL. D., Professor of Surgery in the Medico-Chirurgical College of Philadelphia; Professor of Surgery in the Woman's Medical College of Pennsylvania; Surgeon to the Medico-Chirurgical Hospital, the Woman's College Hospital, The Philadelphia General Hospital, etc. With 69 plates, of which 12 are printed in colors, and 42 other illustrations. 385 pages. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street. 1908.

A review of this book depends considerably upon the point of

view from which it is regarded. If one looks upon it merely as an expression of personal views of a surgeon of long experience, the book is entirely satisfactory. If, however, one regards it as a monograph upon the subject of breast tumors, available to the surgeon or investigator as a work of reference, the book is extremely disappointing. Not that we intend to imply that the author is not in a position to warrant him in writing a personal monograph; the author's researches on the subject of breast tumors are widely known, and are among the best contributions of American literature upon this subject. It seems to us, however, that a book of this character would have attained its highest utility, had the author followed a happy mean between the two points of view, and had combined a calm, judicious review of the previous work done, with an elaboration of the author's ripe experience upon the subject in question. As a matter of fact, however, we find in the volume before us, except in the chapter on carcinoma, very few references to the literature. Even where names of previous authors have been mentioned, the references are not given. On the other hand, the personal pronoun is everywhere predominant. He even uses this to affirm or combat many self-evident statements, and truths which nobody, as far as we are aware, has ever taken the pains to deny. Thus we find such sentences as these: "I cannot agree with those who believe that it (carcinoma) is equally common in the single and married, the sterile and fruitful;" or "In conclusion, I would plainly state, that despite the fascinating theories advanced (speaking of the etiology of carcinoma) and the information derived from the study of statistics, I still remain an agnostic, denying that any theory yet advanced gives entire satisfaction to any one viewing the subject from a liberal point of view." This, incidentally, does not accord with the following; "I am of the opinion also, that some mammary sarcomata owe their origin to misplaced embryonal tissue elements, which assume active growth in adult life." We also find him expressing views on subjects concerning which, we venture to say, he has very little experience. Thus he states: "I am not inclined to attribute much value to the results obtained by inoculating and grafting experiments upon animals, as mice, for example." This opinion, we hold, nobody, in the light of our present knowledge, of this promising field of research, has any right to state. These examples are merely types of many others. The author also wastes many pages of argumentation along conventional lines, upon the now universally accepted proposition, that cancer should be operated upon as early as possible. This would be in place in a popularizing article in a medical journal, but not in a book addressed to surgeons.

We do not intend to convey the impression that this book does not add materially to our knowledge of the subject of breast tumors. Many parts are indeed of considerable value, especially that dealing with carcinoma, which, by the way, covers more

than half the volume. In this chapter, the author shows throughout that his experience has been an extensive one. The development of the modern operation for breast cancer is fully outlined, while the description, both in text and in illustrations, of the Halsted-Meyer operation, with all the more important modifications, is given in great detail. The illustrations and plates are excellent and are a feature of the book. Plate 43, showing Paget's disease of the nipple, should face page 373 instead of page 284. On page 48, "Warthen" should be "Warthin."

On the whole, we believe that the author has missed a splendid opportunity to give us a monograph of the first order. E. M.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Development of the Fetus in Women with Large Pelvic Basin.—Ermanno Signoris (*Ann. di Ostet. e Gin.*, March, 1908) discusses the development of the fetus in women with an abnormally large pelvis, and the complications to which it may lead. His observations include 254 cases, collected from various clinics during the past few years. These he has tabulated, and from these examinations he concludes that abortion is frequent in women with large pelvis. These pelvis should be distinguished from the normal-sized ones because face presentations are abnormally frequent and the duration of labor is not shorter than that in normal pelvis. The fetus becomes developed to an abnormal size and pregnancy lasts longer than in other women. There seems to be no influence in causing twisting of the cord about the neck of the fetus. Twin pregnancies are more frequent than among other women.

Bronchiectasis in the Fetus.—Michel de Kervily (*L'Obstét.*, April, 1908) describes three fetuses that he has examined during the past three months, in which there was present bronchiectasis, incorrectly called cystic degeneration of the lungs. He has found in medical literature six other cases which he has analyzed. Of all these cases he gives the histories. In his first two cases he found no history of syphilitic taint, and no spirochetes were discovered in the numerous sections that were microscopically examined. In the third case spirochetes were present in large numbers in the internal organs. In the first fetus examined, a fetus delivered in the sixth month and dying a few minutes after birth, the upper and middle lobes of the right lung showed enormous ectasia of the lobular and intralobular bronchioles, and of the pulmonary vesicles, and adenomatous tumors consisting of tubes of unequal caliber, sinuous, ramifying and anastomosing, which were developed in an abundant connective tissue replacing the pulmonary vesicles. These tubes were lined with a single layer of cuboidal epithelium. The author presents also observations of

bronchiectasis in a fetus in which there was bronchopneumonia. The author believes that syphilis does not play a prominent part in the etiology of such cases. He classifies these cases as pulmonary bronchiectasis with adenomatous new formations and bronchiectasis of inflammatory origin.

GYNECOLOGY AND ABDOMINAL SURGERY.

Brown-Sequard Paralysis During Menstruation.—Cases of Brown-Sequard paralysis are rare and occur usually as a result of traumatism to the spinal cord. C. D. Camp (*Phys. and Surg., March, 1908*) records a case occurring in a girl of seventeen, non-traumatic, and attributed by him to subarachnoid hemorrhage taking place during menstruation which, previously regular, ceased after one day at the time of onset of the paralysis. Why a hemorrhage into the meninges should occur in a young person with no evidence of arteriosclerosis is hard to say, but the writer suggests that the sudden stoppage of menstruation may have had something to do with it, as it is well known that hemorrhage from mucous membrane or even from skin can occur under such circumstances.

Delayed Menopause.—(C. J. Whalen *Chic. Med. Rec.*, April 15, 1908) reports such a case in a woman who had first menstruated at the age of fourteen. Until she was sixty-two years old her menstruation was regular, four-weekly. It then became three-weekly, and so continued at the time of report when she was sixty-seven years of age. The woman claimed never to have been in bed two days in succession, even at the time of labor, although she had had thirteen children and two abortions.

Torsion of Appendices Epiploicæ.—One of the earliest references to the pathological importance of appendices epiploicæ and corpora aliena adiposa, as they are called when detached, appeared in 1889. With the exception of one other case report, these were ignored until 1905. Since then a number of articles have been published. These are abstracted by W. A. Briggs (*Amer. Jour. Med. Sci.*, June, 1908), who thinks that torsion of appendices epiploicæ is more frequent than the paucity of references in medical literature would imply. This accident usually occurs in persons more or less obese, during middle life and later.

Intra-abdominal torsion of appendices epiploicæ may simulate appendicitis, hepatic colic, cholecystitis and various other intra-abdominal diseases. Torsion of appendices epiploicæ in the hernial sac may cause all the local symptoms of an acute omental or intestinal, femoral or inguinal hernia. Torsion of appendices epiploicæ may result in corpora aliena adiposa, in adhesions and bands, and their consequences. Corpora aliena adiposa may become infected and cause general peritonitis. In the present state of our knowledge, anything more than a tentative diagnosis of torsion of appendices epiploicæ would be rarely possible. Early operation is indicated in all cases.

Surgical Treatment of Cancer of the Uterus.—J. L. Faure

(*Presse Méd.*, May 16, 1908) declares that, contrary to the generally accepted opinion among physicians, cancer of the uterus is one of the most curable forms, provided that the surgical treatment is begun early and is carried out in the right way. He adduces the histories of twelve women operated on by himself who have now been cured for a period of more than four years. He believes that we should combat with all our powers the idea that this formidable disease cannot be cured and should do all we can to get these cases operated on early, assuring the patients that the disease is curable. The public should be so instructed, and thus we shall see patients earlier and get better results.

Prevention of Embolism after Gynecological Operations.—Albert Sippel (*Zent. Gyn.*, April 11, 1908) takes up the question of prevention of embolism by making a small incision, which has been advocated very strongly by some authors. He believes that a large incision which enables the operator to work without injuring the veins is much more conducive to the prevention of embolism, than a small incision in which the operator must work by feeling. The proportion of embolism after myoma removals or castration for myoma is marked, and here the heart action is bad in many cases. There is a negative pressure, after operation in the veins of the pelvis, and this allows them to remain empty and thrombi are easily formed when they slowly fill. He believes that prophylaxis consists in preventing these veins from filling immediately after operation. To do this, he places the patient at first without a pillow, and with the head very low, the lower part of the bed being elevated. This is gradually lowered within the first three days. Thrombosis of the veins is thus prevented.

Ureteral Calculi.—Discussing operative treatment of ureteral calculi, J. H. Gibbon (*Surg. Gyn. and Obst.*, May, 1908) says that stones in the upper third may be removed through a lumbar incision, such as is usually employed for the exposure of the kidney, or through the Israel incision, extending from the tip of the last rib obliquely downward along the iliac crest. The operation should be performed retroperitoneally. When the stone is located, the question will arise as to whether it shall be pushed up into the kidney pelvis and there removed or through the kidney substance. The writer believes that a wound in the ureter, whether sutured or not, will heal more quickly and with less likelihood of a urinary leak than one in the pelvis. For stones in the lower two-thirds of the ureter, the combined intra- and extra-peritoneal route offers advantages over the extraperitoneal, especially in cases where the abdomen has been opened for another condition or for exploratory purposes and a stone then found. One of the chief advantages of the combined method is the ability to explore thoroughly the entire ureter on the suspected side and a large part of the ureter on the opposite side. Another advantage is the fact that it is unnecessary for exploratory purposes

to separate the ureter from its surroundings to any great extent and that damage to it through rough handling is much less likely. The stone can also be much more readily passed up into a healthy portion of the ureter in the combined than in the simple extraperitoneal method. The one objection to this method which can be raised is that of possible infection of the peritoneal cavity.

Effects of Urban Congestion on Italian Women and Children.—Antonio Stella (*Med. Rec.*, May 2, 1908) has recently investigated the Italian population of New York City. He shows that while the general death-rate for the city in 1905-06 was 18.35, and under five years was 51.5, in six of the Italian blocks examined these figures averaged 23.3 and 79.7, respectively. He says that the percentage of Italian children suffering from rickets is exceedingly high (75 to 80 per cent.), in spite of the fact that many of them (65 per cent.) are breast-fed. Rhachitis is not a mere deformity of bones, but is the expression of profound pathological changes occurring in practically all the tissues of the body. Due allowance being made for the defective composition of the mother's milk—which, in his opinion, is the principal factor of the prevalence of the disease, and which in turn reverts on urban congestion that diminishes the stamina of the mothers—overcrowding and bad housing in general seem to be the primary causative agent, even above the dietetic factor, which in the case of the Italians would appear to play only a secondary part. When we compare the general appearance and resistance of Italian children brought up in the healthful environment of the country and those in the city, more important differences are noted, and if we compare their average height and weight, we find an advantage of almost one inch and a half more in height and one pound more in weight for the children of the rural districts. Malnutrition and anemia, scrofula, adenoids and poor dentition are, next to rickets or concomitant with it, the most frequent pathological conditions met with among the children of the New York tenements. That they are the direct result of bad housing, and not heredity, is proved by the fact that almost all Italian infants are born strong and healthy, and their weight is often above the average, even when their mothers look pale and sickly and live in the poorest districts. This fact, besides, seems to be true of all poor classes. Tuberculosis is most prevalent among the second generation of Italians, and while the pulmonary manifestations are seen most frequently above the fifteenth year of age, the surgical form (tuberculosis of the bones, glands and joints) is met with extraordinary frequency between the ages of five and fifteen. Studying the mortality of Italian women, we are confronted with a peculiar contrast: the official statistics show a small death-rate, especially in regard to pulmonary tuberculosis, yet we know that tuberculosis is very prevalent among them. The explanation of this discrepancy lies in the fact that all adult Italians once affected by a serious disease, and so informed, board the

first steamer and go back to Italy to die. Tuberculosis of the adnexa and peritoneum is also seen with great frequency among them. Their early marriages, frequent pregnancies and long periods of lactation are contributory factors, when we consider that the same conditions prevail also in their native land and do not affect their health in the same degree. Other direct injuries to the health of the Italian women referable to urban congestion are: (1) Anemia and chlorosis. (2) Amenorrhea and dysmenorrhea, from arrested or defective development of the generative organs. (3) Retarded menstrual function. The average Italian girl in New York menstruates after the fourteenth and sometimes in the fifteenth year of age, while in Sicily the average period is at eleven or twelve and in the northern provinces at thirteen and fourteen years. (4) Poor muscular development and loss of muscular tone due to lack of exercise and ill-ventilated rooms. One of the most frequent results of this muscular atony is a general displacement and fall of the abdominal organs (movable kidney, enteroptosis, etc) with which 85 per cent. of the Italian women that present themselves for examination at gynecological clinics are afflicted. (5) Gastric and intestinal disorders (constipation, dyspepsia, etc.), the direct result of the ptosis just mentioned and of polluted atmosphere in close quarters, with all the attending symptoms of autointoxication (headache, irritability, emaciation, etc.). (6) Skin diseases, especially scabies, ringworm, eczema. (7) Specific diseases, including lues and all venereal diseases. These, in a large measure, are the evils caused by congestion, and these the physical results of overcrowding on Italian women and children. The moral effects are just as great and serious. The homelessness of the tenement and the absolute absence of privacy of family life make the abode of the poor one of the greatest perils of modern civilization..

Primary Carcinoma of the Vermiform Appendix.—C. A. McWilliams (*Amer. Jour. Med. Sci.*, June, 1908) presents a study of ninety cases, three previously unpublished, and appends notes of fifteen others subsequently found. Speaking of the series of ninety cases, he says that of seventy-six operated upon for known reasons, sixty-three (83 per cent.) suffered from appendicitis. Of those twenty-three (36 per cent.) were operated upon during or immediately after the first acute attack, while forty (63 per cent.) had had symptoms of chronic appendicitis. In seventy-eight cases in which ages are recorded, forty-seven (60 per cent.) were under thirty, corresponding very closely with the age incidence of inflammatory appendicitis. In seventy-seven cases of primary cancer of the appendix in which sex is mentioned, forty-four (57 per cent.) were females and thirty-three (42 per cent.) males. Concretions apparently form no rôle in the etiology of primary cancers of the appendix, since in ninety cases they were found only five times (5.5 per cent.). In seventy-one cases in which the situation of the tumors was recorded, in 59 per cent. the neoplasms were located at or near the tip, and in

76 per cent. at or distal to the middle. Primary cancers of the appendix thus develop in the regions where strictures, obliterations of the tip and chronic inflammatory lesions most commonly occur. Enlarged lymphatic glands were recorded as present in eight cases, or 9 per cent. In four of these cases, microscopic examinations showed that there was no cancer in them, and in one case such secondary cancerous involvement was found. Hence, we must infer that these primary cancers of the appendix are exceedingly slow in involving the lymphatics. Three cases are not recorded as having had the enlarged glands examined microscopically. In forty-two cases out of forty-eight in which it is recorded, no tumors were visible to the naked eye in fourteen cases, or 33 per cent. In twenty-three cases, or 55 per cent., one or more solid tumors were visible. Cysts were present in three cases, or 0.7 per cent. Perforations were present in two cases. Ulcerations were found in two cases. It is evident how fallacious it is to argue that because there is no visible tumor, consequently there is no cancer present. The frequency of occurrence of primary cancer of the appendix is approximately shown in the fact that twenty-six such cancers were found in 6505 appendices, or 0.4 per cent., though it is not stated in what proportion of these cases microscopic examination of the appendices was made. In addition, cecal cancers undoubtedly develop from primary appendical cancers, in which case the latter lose all their characteristics as the primary lesion and are overlooked as such. In seventy-one cases it was possible to make a pathological classification of the neoplasms. Twenty-two per cent. were columnar-cell cancers, 53 per cent. were spheroidal-cell, 9 per cent. were of the transitional type, and 4 per cent. were colloid. The average age in the spheroidal-cell tumors was twenty-three years; in the columnar-cell type, forty-three years. Of the forty-eight cases there are records regarding the microscopic extent of the growths in the appendices in thirty-one cases. In fifteen cases, or 48 per cent., all the coats of the appendix were invaded, while in seven cases, or 22 per cent., the meso-appendix, in addition, was involved in the growth. Thus these neoplasms show a tendency progressively to infiltrate contiguous structures, but without evincing evidences of producing distant metastases. Probable slow growth evidenced by the fact that in all cases mitotic figures are very few. Of ninety patients with primary cancer of the appendix, secondary growths were present in six (6.6 per cent.). In seventy-nine of the patients operated upon, the duration of the reported cures is given in thirty instances: seven were well five years or more after the original operations, thirteen were so three years or more afterward, while twenty-one showed no signs of recurrence two years or more after operation. In only one instance, or 1.2 per cent., is it definitely stated that the growth recurred. These primary tumors of the appendix should be placed in a distinct class by themselves, so far as malignancy is concerned, in con-

tradistinction to malignant neoplasms of the alimentary tract generally. The mortality in forty-six operations was *nil*. The symptoms of appendical cancers are not sufficiently characteristic to make a diagnosis *per se* possible without operation. Any circumscribed tumor in an appendix should arouse suspicions of cancer, following which the meso-appendix should be widely excised and enlarged glands removed. It will be necessary to excise part of the cecum only when the tumor is situated in the base of the appendix. In every appendectomy the entire meso-appendix should be removed if possible, and every removed appendix should be examined microscopically. When operating in the neighborhood of the appendix for reasons other than appendicitis, the appendix should be amputated in case it presents any abnormality, particularly when its tip is clubbed. In addition to the cancers themselves found in the appendices, in thirty cases out of forty-eight, or 62 per cent., chronic inflammatory lesions were discovered by the microscope. Whether the chronic changes are primary and the cancers secondary to these, or *vice versa*, it seems impossible to decide in the present state of our knowledge of the subject.

A. O. J. Kelly (*Amer. Jour. Med. Sci.*, June, 1908) contributes the reports of four additional cases of primary carcinoma or endothelioma of the appendix.

Treatment of Cancer of the Female Genital Organs.—J. L. Faure (*Ann. de Gyn. et d'Obst.*, June, 1908) says that there is no divergence of opinion as to the treatment of cancers of the genital organs outside of the uterus. The only treatment admissible is extirpation as early as possible and widely outside the borders of the growth. Cancer of the vulva requires the removal of the glands in the inguinal region of both sides. For cancer of the fundus, abdominal hysterectomy is to be preferred to removal by way of the vagina. It allows of complete removal without laceration and removal in pieces as must be done by the vaginal route, a procedure that easily gives rise to sepsis and favors recurrence. The author believes that a total hysterectomy is to be preferred, although not absolutely demanded. All that is necessary is to absolutely pass the boundaries of the growth toward the cavity of the uterus. In these cases the cervix is generally not involved, and recurrences do not occur in it, but take place in the broad ligaments and pelvic glands. Cancer of the vagina is rare. When it occupies the lower two-thirds it should be removed as are cancers of the vulva, while when it occupies the upper third it is to be treated like cancer of the cervix. It is very difficult to remove the cervix or upper part of the vagina by the vaginal route. The small space in which one has to work does not allow of removing the growth whole, and the hemorrhage renders it impossible to see where the diseased tissue ends and the sound begins. The fear must be ever present of cutting into the rectum, the bladder or the ureter. To have room to make a perfect operation the vaginal route must

be abandoned and the abdomen opened. Here there is room to work and a possibility of seeing what is being done. Cancer of the cervix is deplorably frequent and its gravity so great that it taxes all the means of surgery. The gravity of the operation is in direct proportion to the extent of the growth. Of the eighteen patients operated on by the author between 1902 and 1905 ten are still living and apparently cured. The author believes himself justified in thinking the operation curative, not simply palliative. By the abdominal route the dissection of the pelvic glands is possible. The only argument against abdominal hysterectomy is its gravity. But we are dealing with patients who will inevitably die if left alone. What we must do is that operation which will give the best chance of recovery without recurrence. The author always ligates the hypogastrics, since this limits the hemorrhage and allows the operator to see better the field of operation. He removes the glands that can be easily felt by the finger. To remove all the glands is impossible. He prefers not to open the large cellular spaces, as this gives a greater chance for infection.

Typhoid Fever During Pregnancy.—A statistical study of the cases of typhoid fever in the Johns Hopkins Hospital, by B. A. Cohoe (*Can. Lancet*, May, 1908) shows that pregnancy confers no immunity against typhoid infection. The association of typhoid fever and pregnancy occurs most commonly toward the end of the first half of pregnancy, from the third to the fifth months. Abortion follows in about two-thirds of the cases, and takes place most frequently during the second and third febrile weeks. The prognosis for the mother is good, the mortality being not greater than in the nonpregnant typhoid patient. The production of abortion is not indicated. Infection of the fetus through placental transmission may occur but it is not the rule. The treatment is the same as in the nonpregnant. Baths are well borne.

Blood-pressure in Eclampsia.—G. S. C. Badger's (*Bost. Med. and Surg. Jour.*, May 7, 1908) conclusions are that the blood-pressure in eclampsia is high, and of diagnostic and prognostic importance. In spite of improvement in subjective symptoms and increase in the quantity of urine, the blood-pressure may remain high, in which case the prognosis is grave, and labor ought to be induced. The continuance of high blood-pressure during the puerperium warrants a grave prognosis as to complete recovery.

R. C. Davis (*Univ. Penn. Med. Bull.*, May, 1908) says that in cases of eclampsia under treatment, where a fall in blood-pressure is noted there is also seen a fall in the amount of albumin. The most efficient agencies for reducing blood-pressure have been found to be vapor baths, puncture of the membranes, nitroglycerin, and venesection. The most successful factors in the treatment of eclampsia have been found to be remedies which lower blood-pressure and agencies which eliminate toxins.

Toxin of Eclampsia.—In order to determine whether or not the blood of eclamptic women or that of the eclamptic placenta contained an active, nonproteid body, which might perhaps be isolated and recognized to belong to one of the established pharmacological groups of poisons or to form a representative of a new group. W. F. Boos (*Bost. Med. and Surg. Jour.*, May 7, 1908) has endeavored to obtain proteid-free solutions from the blood and placentas of eclamptic cases by the application of heat with consequent inactivation or precipitation of serum or tissue juice constituents. To test the activity of his solutions he employed intravenous injections into rabbits. Perusal of the histories of his cases shows that the clinical picture of the case gives no indication of the presence or absence of such a toxin in the blood and tissues. In some cases the solution and proteid-free extract obtained from the placenta were absolutely inactive. Investigation of others would seem to show that there are certain cases of acute intoxication, due to a definite nonproteid active principle, which during life present the clinical picture of eclampsia. Much more experimental work will be necessary to enable us clinically to distinguish the cases in which the toxin is present, from cases of "eclampsia" due to other causes, such as epilepsy and uremia. The solutions obtained do not, as a rule, produce the convulsions typical of eclampsia. Possibly the toxic substance undergoes certain modifications of structure or composition during its isolation which affect the quality of its action. Perhaps the toxin is identical with that acting in the class of cases reported as eclampsia without convulsions. The writer's toxin acts only when injected intravenously. It seems to be a protoplasmic poison. It paralyzes the centers of the brain and cord, especially the respiratory center.

Amylene Hydrate in Eclampsia.—Harle (*Münch. Med. Woch.*, May 26, 1908) states that amylene hydrate may be given subcutaneously or by intramuscular injection as well as by rectal injection. The author has successfully treated a succession of epileptic cases with this remedy. It results in a quiet sleep with absence of convulsions. There exists in puerperal eclampsia, as in epilepsy, a marked poisoning of the brain and nervous system, and the use of narcotics is rational. Amylene hydrate causes paralysis of sensibility, motility and reflex action, without poisonous symptoms except when enormous doses are given. The author has treated five cases, one of which came into his hands in deepest coma and another with complete amaurosis. The urine of all of them was scanty and full of albumin. As a European physician in a Turkish country, he was careful of the means used. The appearance of a quiet and deep sleep was welcomed by those around the patient. After the injection of amylene hydrate another of pilocarpin was given. Labor was completed during sleep in all five cases, and all five patients recovered. The albumin disappeared from the urine soon after labor.

Influence of Pregnancy upon Medical Diseases and Vice Versa.—In the Goulstonian Lectures. Herbert French (*Lancet*. May 2, 9, 16, 1908) touches upon many interesting points in this broad field. He says that diagnosed early and treated by confinement to bed with antipyuric remedies, pyelonephritis usually tends toward resolution, notwithstanding continuance of the pregnancy. In the majority of cases of ordinary severity the pregnancy is not particularly apt to come to an end prematurely. The children do not show any special liability to die *in utero* and the mother is not subject to uremic convulsions at the time of labor. Medical treatment will usually relieve the patient within three weeks or a month. The pyuria will often persist for a month or six weeks after the patient feels quite well, and relapse is apt to occur before the pregnancy reaches term. Repeated microscopical examination of the urine is therefore essential, and medical supervision is required as long as any pus is present. The patients nearly always get perfectly well of their pyuria after the child has been born.

It would seem that pregnancy does not predispose to a primary attack of appendicitis and that there is no particular liability for pregnancy to light up fresh appendicular trouble in cases where the former attack occurred years before and appeared to resolve completely. Upon the whole, operative measures should be accelerated rather than postponed in pregnant women, and operation should be advised on the very ground that the patient is pregnant, particularly in the later months of pregnancy; owing to the vascularity of the parts, pus is even more likely to occur in these cases than it is in others; the prospect as regards the child is so poor in any case that the course followed should be almost exclusively that which is in the greatest interests of the mother; and the emptying of the uterus by spontaneous miscarriage or premature labor is so likely to occur and with it a rending open of a previously localized inflammation, with consequent spread to the general peritoneal cavity, that it is very dangerous to wait.

Of the specific fevers, he says that the course of typhoid is the same as in other persons, but that in the majority of cases abortion or premature labor occurs. Before the end of the third week of the mother's illness the child is much less likely to have become infected than it is in the fourth or a later week. If, therefore, the pregnancy has reached the time when the child is viable, and if for any reason it is much desired that a living child should be born, it would seem best to bring about delivery before the mother's illness had reached the end of the third week. The prognosis of measles is good as regards the mother, but abortion or premature labor often occurs in the eruptive stage. In pertussis there is danger of premature emptying of the uterus in consequence of the extreme and constantly repeated contractions of the diaphragm and abdominal muscles, but otherwise the prognosis is good, both as regards the mother and the

child. Scarlet fever in a pregnant woman has a relatively much graver prognosis than it has in other cases. The complication is least serious when it occurs early in the pregnancy and when it does not lead to abortion. In pregnant women, diphtheria often attacks the larynx, and if antitoxin is not given the mortality is high. The prognosis of small-pox is worse in pregnancy and is grave for the child. Malarial cachexia has almost no influence upon pregnancy and its course; in mild cases of intermittent malaria pregnancy usually continues normally to term notwithstanding the ordinary attacks of fever in the mother; in cases where the maternal temperature reaches 104° F. during the attacks abortion takes place in a large proportion of cases; whilst in the bilious remittent type not only is the pregnancy almost certain to terminate prematurely, but also the child, even if it has reached a viable age, is nearly always dead, and the prognosis as regards the mother is distinctly graver than it would be in a nonpregnant person with the same degree of malarial illness. Quinine should be given all the more on account of the conjunction of malaria and pregnancy. The weakness that is left after the acute phase of influenza is apt to last even longer in the pregnant woman than it is in other persons, and therefore even if the pregnancy does not come to an untimely ending the child is very apt to be born with deficient vitality and a tendency to die young. If lobar pneumonia occurs early in pregnancy the prognosis for the mother is little, if any, worse than in other patients of the same age, while abortion will occur in one-third of the cases. If the pneumonia develops during the latter half of pregnancy, the latter will be terminated in two-thirds of the cases, while half of the mothers die if at or after the sixth month.

Diabetes mellitus is by no means incompatible with pregnancy; cases of moderate severity are not made materially worse by pregnancy; and there seldom seems to be any reason for interfering with the pregnancy. Diabetes insipidus may arise during pregnancy as the result of a severe mental shock at that time. Should it do so, it seems that it does not go away again after the child is born. The pregnancy itself runs no abnormal course, the children may be perfectly healthy, and there is no marked tendency to hydramnios with its inordinate abdominal distension, such as occurs in diabetes mellitus.

Intrauterine Fetal Death.—H. Williamson and E. L. Holland (*Jour. Obst. and Gyn. Brit. Emp.*, May, 1908) contribute to the literature of this subject the report of a woman who gave birth to six still-born children in consecutive pregnancies. Neither the woman nor her husband gave any history or evidence of syphilitic infection. After the sixth labor the fetal liver and spleen were examined for spirochæte pallida. This organism was found in abundance. During the succeeding pregnancy the woman was treated continuously with mercury and potassium iodide. When the height of the fundus indicated the

approach of term, labor was induced. Unfortunately the case proved to be one of twin pregnancy with hydramnios and the children were premature and survived only a few days. Examination of the body of one child, however, showed no cause of death except prematurely and no spirochætes were discovered. The other child showed bronchopneumonia of both lungs.

Deep Cervical Incisions for Abnormal Rigidity.—N. R. Mason (*Bost Med. and Surg. Journ.*, April 30, 1908) records two successful cases of delivery by this method. He claims that where immediate delivery is demanded in the presence of an undilated and rigid cervix, multiple deep incisions from the border of the external os to the uterovaginal junction furnish the most rapid and safest method of emptying the uterus. There is no danger of the incisions tearing in cases under full term, or in cases at full term, where the pelvis is normal and the fetus is of moderate size. There is no risk of hemorrhage when clamps are employed before making the incisions. The chance of septic infection is no greater than after the lacerations occurring at the time of normal delivery. The scars in the cervix and vaginal vault cause no trouble in the course of subsequent pregnancies and labors.

Primary Ovarian Pregnancy.—To substantiate a diagnosis of ovarian pregnancy. (1) The tube on the affected side must be intact and have no organic connection with the gestation sac. (2) The fetal sac must occupy the position of the ovary. (3) It must be connected with the uterus by the ovarian ligament. (4) Definite ovarian tissue must be found in the sac wall in several places. C. C. Norris and C. B. Mitchell (*Surg. Gyn. and Obst.*, May, 1908) record a case in which all these criteria are fulfilled. They have found recorded sixteen positive cases of this type, fifteen probable cases and nine fairly probable.

Fecundity after Double Oophorectomy.—F. K. Green and S. W. Hunter (*Med. Times.*, May, 1908) say that the presence of multiple ovaries in an unknown percentage of cases may be regarded as distinctly proven. Pregnancy occurring from coitus practised shortly after double oophorectomy may more often than otherwise be explained by retention within the uterus of ova deposited there prior to the operation. The presence of a supernumerary ovary having a separate and distinct ovarian ligament and accompanying Fallopian tube seems to be an extremely rare anomaly, although such instances have been recorded. It is impossible for the operator to be always absolutely positive that he has eliminated every vestige of ovarian tissue, especially since when oophorectomy is undertaken and performed it is usually for relief of palpable and demonstrable existing disease and the normal topography of surrounding structures has become decidedly altered by reason of the pathological process. Spermatozoa deposited within the vagina or the uterus may retain their vitality and power of motility for

many days (exact period unknown), and if a delayed ovum be encountered in the uterus fertilization thereof is not unlikely regardless of the time when double oophorectomy may have been performed, or indeed whether the ovaries be absent or present.

Intramuscular Injections of Collargol in Puerperal Infection.—Federico Caldesi (*Ann. di Ostet. e. Gin.*, April, 1908) says that the modern treatment of puerperal infections is characterized by the attempt to produce an active leukocytosis, thus reinforcing the powers of nature to oppose the poison of infection. The substances used are collargol and nucleinate of soda. The latter drug has been unsatisfactory and at present collargol is most used. The latter drug, without being an efficient disinfectant has the power of antagonizing the development of germs in a culture. It is nontoxic, produces a marked leukocytosis, and augments the glycolytic power of the blood. The author has used it in a certain number of patients by intravenous injections with success; but this method is sometimes accompanied by bad effects and is not well tolerated. The best method of use is by intramuscular injection, which is rapid and not dangerous. These intramuscular injections are better tolerated by the patients and no bad effects have been encountered. Ten cases have been treated in this way of whom nine were cured. All were cases of severe infection and would have died without this treatment, as all other measures had failed. The case that died was brought to the hospital on the sixth day of infection with a very high temperature. Histories of the ten cases are given. Six of the cases showed no localization of the infective process, one had a slight thrombophlebitis of the saphenous vein, and two were localized in the tube and adjacent tissues.

Pubiectomy at Bumm's Clinic.—P. Kroemer (*Berl. klin. Woch.*, June 1, 1908) gives the results of the pubiectomy operations that have been done at Bumm's Clinic in Berlin. He divides the patients into three groups; the first represents the rachitic flat pelvis, with a conjugate of $7\frac{1}{2}$ to $8\frac{3}{4}$ cm. and the characteristic pendulous abdomen and waddling gait. The second group is the generally contracted pelvis. These women are well-built to all outward appearance, but are small and infantile in appearance. All the diameters are contracted and the conjugata vera varies from 8 to $9\frac{1}{4}$ c.m. The third group shows the combination of the general contraction with a one-sided rachitic contraction, the most difficult class of pelvis to deliver. The diameters vary from $6\frac{1}{2}$ to 9 cm. Two of the patients presented had a normal labor following the operation, a year or more later, the labor being easy. The reason of this easy labor lies in the dilatability of the cicatrix between the bones, which is rarely of true bony tissue, and sometimes will stretch to two fingers breadth in a following labor. All the patients operated on are able to walk well and naturally. The operators in this clinic all use the subcutaneous method, and hardly any cicatrix is left. The arteries,

corpus cavernosum of the clitoris, bladder and vagina are avoided by this method, the hemorrhage is not serious, there is no danger of infection from the vagina, and in general there are no wounds of the soft parts. If possible labor is allowed to evolve spontaneously and in other cases when the delay is dangerous to mother or child a delivery by forceps is undertaken. The author includes in his series fifty-three cases with one death. The dangers of this operation have been discussed generally. Hemorrhage is slight by this method. The important lesions are those of the soft parts, and these are made by the too great pressure and stretching of the bones by the delivery of the head, not by the operative procedure itself. Out of twelve spontaneous labors only three patients had tearing of the soft parts. Perforation of the bladder occurred three times out of fifty-three operations, and healed spontaneously. Out of the fifty-one cases that were delivered artificially seven had serious tearing of the soft parts, bladder or urethra. The interference was undertaken because of asphyxia of the child, tearing of the cervix, severe pressure, threatened infection, etc. The single death was from pulmonary embolism two weeks after operation. All the patients had fever. Of the children forty-nine lived after birth, and three died of pneumonia, having been born alive. These deaths came about because operation was delayed too long. There is no danger to the patient from the sawing of the pelvic bones, but the source of danger is the operative labor when that is needed afterward. The indication is to allow of birth by the forces of nature whenever possible.

Secondary Rigidity of the Cervix due to Acute Inflammation in the Course of Labor.—A. Couvelaire (*Ann. de Gyn. et d'Obst.*, June, 1908) tells us that in the course of labor and under exceptional conditions the borders of the os uteri become thick and rigid so that they cannot be dilated by the natural means and labor comes to a standstill. When delivery does take place it is by the infant's head tearing the cervix, sometimes lineally, sometimes circularly so that the lower part of the organ comes away at delivery, or hangs torn in the vagina. There exists a serosanguineous infiltration of the connective tissue of the cervix, due to an intense congestion from pressure. There may be also an infiltration with leukocytes. The author believes that this condition will not occur in a normal cervix, but only in one that is inflamed before labor with a resulting secondary rigidity. The cervix may be the seat of passive edema or it may not. Acute inflammation of the cervix occurs at the time of labor and we have a cervix that is tumefied, indurated and inextensible. With this condition we have a labor that is slow, with premature rupture of the membranes, irregular contractions, necessitating many examinations, and ending in a febrile state with vaginal infection. Infection of the genital canal is probably the cause of this inflammation of the cervix.

GYNECOLOGY AND ABDOMINAL SURGERY.

Anatomo-pathological Study of Pararenal Tumors.—E. F. Pietrabissa (*Ann. di Ostet. e. Gin.*, April, 1908) divides pararenal tumors into two classes: those that start from the tissue of the kidney or of the suprarenal capsule or from aberrant germs of these tissues, and those that develop in the neighborhood of the kidney, mainly from the fibrous and adipose tissues of the capsule of the kidney. These tumors are distinguished by the absence of functional alteration of the kidneys. Most of these tumors come into the hands of the gynecologist for operation inasmuch as they generally occupy and invade the pelvis during their growth. Pararenal growths are comparatively rare and little known. The author describes a case in which the tumor had been growing for many years without producing any symptoms except those of pressure, and until the growth had attained a size greater than that of a pregnancy at term. The patient complained of constipation, backache and difficulty in walking and standing on account of the weight of the tumor. When removed it was very adherent and so enveloped the kidney that it was impossible to separate it, and the kidney had to be removed with it. It was found to be a fibrolipoma in the center of which there was sarcomatous degeneration. These tumors are found usually from the age of thirty to sixty. They are generally very large, and occur more frequently in women than in men. They develop slowly, always growing progressively; produce few symptoms aside from those of the intestinal canal; are generally found just below the diaphragm; can be compressed between a hand behind and one in front of them. The kidney is not affected; they move with the respiratory excursions, and the uterus, ovaries, liver and spleen are found intact. The author finds in medical literature thirty-nine other cases originating from the fibrous capsule of the kidney. These tumors are essentially benign; only by degeneration do they become malignant. When removed before they are very large and adherent the prognosis is good. An exact diagnosis of the type of tumor is not always possible before operation, but the indication for operation is always present and the kind of tumor is unimportant.

Corpus Luteum of the Ovary in Woman.—Fernand Villemin (*La Gynécologie*, May, 1908) has made a study of the corpus luteum in animals and in woman that leads him to the conclusion that this body is a glandular body with a secretion of its own. It is a transitory body which forms in the ovary of the mammiferæ at the expense of the wall of the Graafian follicle after this has ruptured. The morphological characteristics and the period of its existence are such as to cause its resemblance to the glands with internal secretion. It holds under its dependence the genital organs of woman and female mammiferæ. The rupture of the follicle occurs ten to twelve days before menstruation, and the period after rupture corresponds to that of the formation of the corpus luteum. The perfect formation of the cor-

pus coincides with menstruation. Involution begins in the corpus luteum when menstruation ceases. Suppression or non-development of the corpus luteum causes suppression of menstruation. That the corpus introduces into the circulation a material that is toxic and vaso-dilator is demonstrated by the result of injections of its extract into the circulation. Its appearance determines the appearance of puberty, and its absence prevents menstruation and the occurrence of puberty. The formation of the corpus luteum is sufficient to account for all the manifestations of each menstrual period. The menopause symptoms are due to the disappearance of the corpus luteum.

Diffuse Adenoma of the Cervix Uteri.—H. Hartmann and P. Lecéne (*Ann. de Gyn et d'Obst.*, April, 1908) consider the subject of diffuse adenoma of the cervix uteri in its relation with uterine cancer, and gives an illustrative case. The evolution of the disease is exceedingly slow, and it may simulate in many respects uterine cancer. Hemorrhage begins very early and occurs for some years before the growth is of any great size. In such a time, any cancer would have attained larger proportions than these growths have reached, and would have infiltrated the neighboring tissues and organs. In adenoma the base of the broad ligaments is found supple and not infiltrated. Only the examination of the removed growth will make a definite diagnosis of the growth from cancer. A question of importance is the benignity of the growth, which is indicated by its histological structure. It certainly differs materially from the malignant growths. The evolution of other primary growths of cylindrical cells in the cervical cavity is generally rapid and malignant. In the author's case a careful examination of the removed growth was made. There were cauliflower vegetations filling the cervix. The musculo-connective-tissue layer of the cervix was intact, and the penetration of the growth was stopped abruptly by it. There was present in the cervical canal an immense ulceration which was filled with vegetations and the growth had not penetrated the tissues of the cervix proper. At the edges of the ulceration the process was abruptly arrested. The isthmus and body of the uterus and the parametrium were not affected. The vegetations were made up of a large number of pseudoglandular cavities, lined with cylindrical epithelium, not ciliated, similar to the mucous glands of the cervix. These cavities were all included by a basement membrane. There was no tendency to infiltration of the surrounding tissues.

Mixed Tumors of the Uterus.—P. Puech and G. Massabuau, (*Gaz. de Gyn.*, May 15, 1908) find that true mixed tumors of the cervix are extremely rare, only about a dozen being found in medical literature. They appear more frequently as pediculated tumors, growing like a bunch of grapes in the vaginal cavity. There are true sarcomas, fibro-sarcomas and degenerated sarcomas. These tumors are composed of several kinds of tissues, some of them heterotopic, not growing as a proliferation of any

of the cellular elements of the organ. They are embryomas. The author gives the history of a case in which there was an adeno-myxo-chondro sarcoma of the cervix. The greater part of these tumors are formed of fibrous connective tissue, myxomatous, sarcomatous and adipose tissue, with unstriped muscular tissue and elastic fibers. Other tissues that are unnatural to this location are cartilage and striped muscle-fibers. The cartilage is hyaline and is found in patches in the midst of a dense connective tissue or shows intermediate gradation from myxomatous tissue. The explanation of the occurrence of such growths is somewhat difficult. According to some, these are degenerated sarcomata, the cells of which are endowed with metaplastic properties. Another hypothesis is that the striped muscle-fibers have been transformed from unstriped ones, a position that is hardly tenable. The most plausible theory seems to be that these cells result from the presence of embryonal remains of a chondrogenic or myogenic character. This theory accounts for their position and the details of their structure. But the most important argument is that from portions of the uro-genital system may develop tissues of all these varieties. Clinically, all these tumors appear under the form of vegetating masses like the *hydatidiform mole*. This is simply the result of their mode of development in a cavity. The symptoms are hemorrhage, leukorrhoeal discharge and pain. In some cases fragments of the tumor are expelled. The evolution of the tumors is like that of true malignant tumors. Left alone, they produce death from cachexia. Operated upon they recur very rapidly. There may be metastases at a distance. Treatment consists of early and complete removal of the uterus entire. Any simpler operation will result in a rapid recurrence and death.

Elephantiasis Nostras of the Female Genital Organs.—R. Traina and E. Marconi (*Ann. di Ostet. e Gin.*, April, 1908) use as a text for their consideration of the subject of elephantiasis of the female genital organs the case of a child six years old in whom enlargement of the genitals began at the age of three years. When seen by the author she had considerable enlargement of the labia majora and the mons veneris. The growths were removed and a careful histological examination made without throwing any light on the etiology of the growth. There were no changed lymphatic glands. The bacteriological examination was completely negative. This affection frequently attacks the labia majora, clitoris or any of the tissues of the external genital organs. It is generally seen between the ages of twenty and forty, occasionally in children. Pregnancy appears to aggravate the condition. It is generally considered to result from syphilis, blenorragia, erysipelalous inflammations, trauma or alterations of the lymphatic glands of the region. There are no characteristic and specific alterations that distinguish it from other affections of the parts. Alterations of the vessels and lymphatics exist in all cases. Any irritative lesion may cause it. The

author does not admit that syphilis is its invariable cause. In the author's case there was no trace of syphilitic infection, acquired or congenital. An argument against that view is that it is comparatively rare while syphilis is frequent. The greatest importance is ascribed by some authors to lesions of the lymphatic glands of the region. The presence of *filaria sanguinis hominis* may be its cause in tropical countries, but in this climate it is not found. The author discards the theory of lymphatic or blood-vessel obstruction as its cause. While inflammatory condition may contribute to it, they can hardly be the determining causes. Neither can irritations of the genitals be a direct cause. Trauma may be the original lesion. The author believes that many factors have to do with the etiology of this condition and that no one alone is the invariable cause. Its course is essentially chronic and progressive. It produces no disturbances except by its mechanical position, weight, the ulcerations that may occur on its surface, and the discharge and odor caused by them. Its treatment is purely surgical, removal being the only course that can be pursued.

Sigmoidal Factor in Pelvic Diseases.—Many cases giving symptoms referred to the uterus and ovaries are really suffering from affections of the sigmoid and rectum. This is so common in his opinion, that J. R. Pennington (*N. Y. Med. Jour.*, May 23, 1908) believes that examination of these organs should precede that of the genital tract. One of the objects in making a rectal and sigmoidal examination is to ascertain whether or not the sigmoid and rectum are emptied and refilled periodically. If the patient has fibrosis of the rectal valves, chronic hypertrophic or atrophic proctosigmoiditis, contractions, strictures, kinking, adhesions, or an extra long sigmoid or mesentery or other conditions interfering with the regular rhythmic loading and unloading of the sigmoid and rectum, she, in the course of time, is most likely to have leukorrhœa, dysmenorrhœa, and other symptoms pointing to the beginning of a pathological state in her genitalia. The mere statement of a patient that she is not constipated because her bowels move once or twice daily is not to be accepted as conclusive evidence that she has not an overloaded bowel. If the conditions causing these troubles have advanced to that stage where they cannot be corrected by simple methods and general tonic treatment, then laparotomy should be performed; not, however, for the purpose of removing the tubes and ovaries, but to apply such surgical measures to the offending sigmoid, as may seem indicated. Incidentally, any requisite operative work on the uterus, tubes, and ovaries should be done at the same time.

Rapid Intestinal Anastomosis.—E. W. Andrews (*Jour. Amer. Med. Assn.*, May 16, 1908) finds in the McGraw ligature the following advantages: 1. Exclusion of mucosa. No hole but the needle puncture is made in the viscus, hence no clamps are needed and no leakage can occur. 2. Anemia of the tissue

divided. No bleeding can occur because of the pressure and because no cutting is done. 3. Saving of time. The time of the visceral part of the work ranges from four and one-half to eight and one-half minutes. To offset these advantages several serious drawbacks are met. 1. It does not create at once an opening. This limits its use practically to stomach work. 2. It crumples and puckers the bowel and stomach wall so that the surrounding Lembert stitch becomes irregular and may narrow the opening. To overcome these disadvantages the writer has devised this procedure. A forceps having blades equal to the length of the openings desired in the viscera, these blades being bodkin pointed, like the McGraw needle, and rather slender is thrust into the two opposing organs after the preliminary suture exactly as the McGraw needle is used. When the handles are closed the blades act as clamps holding the parts in a straight line. This makes an excellent splint and guide for placing the anterior part of the suture. The latter is continued until it meets the starting point, when one loop of the last stitch is made to surround blades near their point of insertion. After locking the blades hard enough to crush the walls and hold them firmly a slender chisel-pointed blade is thrust through two grooves which form a sort of tunnel in the closed blades. This cuts a linear opening entirely through the walls of both viscera. For the sake of greater asepsis and hemostasis followed by a cautery blade. No large arteries like those in the stomach wall should be crossed by the line of anastomosis. The line of opening should be between parallel branches. The crushing action of the forceps and the subsequent use of the heated probe tend to make the work bloodless, but our main dependence should be on careful deep suturing. Each vessel should have a continuous loop of linen thread thrown about it as the stitch line crosses it. In fact the whole suture should be deep and mattress like.

After-treatment of Laparotomies.—Max, Jerusalem (*Münch. med. Woch.*, May 26, 1908) considers the treatment of the painful symptoms that often remain after otherwise successful laparotomies. He believes them to be due to adhesions of the various organs, especially the intestines. These frequently occur when primary union does not take place and the wound must be drained. Prophylaxis is believed to consist in keeping the intestines from remaining quiet, morphin no longer being used. Diet is full from the first day, oil injections are given, and subcutaneous injections of physostigmin. High injections in the knee-elbow position, injections of air, energetic massage and faradization of the abdomen are given to stretch the adhesions. The author has made use of the Bier suction glass in a series of cases with excellent results. On the third to the fifth day an oval bell-glass is placed over the laparotomy scar for from fifteen to twenty minutes. The skin becomes red, and the patient feels a comfortable sensation of warmth, and after the removal of the suction the pressure feeling is less

After from six to twenty-two sittings the painful symptoms have all disappeared, and where resistance was felt all is soft and supple. Obstipation is relieved. The author gives histories of twelve cases treated in this way. All the patients were very willing to undergo the treatment and expressed themselves as satisfied with the results. The relief may be due to hyperemia or to the mechanical action of the force applied by the vacuum.

ITEM.

THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS will hold its twenty-first annual meeting at the Hotel Belvedere, Chase and Charles Streets, Baltimore, Md., Tuesday, Wednesday and Thursday, September 22, 23 and 24, 1908, under the presidency of Dr. E. Gustav Zinke, of Cincinnati. Drs. W. A. B. Sellman, Joseph H. Branham and William S. Smith, of Baltimore, constitute the committee of arrangements.

The following papers have been offered up to July 25, 1908, and will be published in this JOURNAL.

1. The president's address: The solving of the problem of obstetrics, E. Gustav Zinke, Cincinnati.

2. Pubiotomy on the nonpregnant woman; report of a case operated, John H. Bell, Detroit.

3. The technic of the operation for periappendiceal abscess, William A. B. Sellman, Baltimore.

4. The comparative merits of abdominal celiotomy and colpotomy in the treatment of intrapelvic abscess, William S. Smith, Baltimore.

5. Shock in obstetrical practice, Adam H. Wright, Toronto.

6. Fibroid tumor of the uterus resembling pregnancy, with exhibition of specimen, Raleigh R. Huggins, Pittsburg.

7. Report of a case of impossible labor from ovarian dermoid; Cesarean section; recovery. Induction of labor in the second confinement, Walter P. Manton, Detroit.

8. Ovarian cystomata complicating pregnancy, Charles G. Cumston, Boston.

9. Experiments upon animals relative to the question of abdominal supporters after laparotomy, Robert T. Morris, New York.

10. A short history of fibroid operations during pregnancy, J. H. Carstens, Detroit.

11. Subdiaphragmatic abscess, with report of cases, John W. Keefe, Providence.

12. Specimen of uterus and appendages showing a recent curet perforation and the result of vaginal section for extrauterine pregnancy seven years before hysterectomy, Joseph H. Branham.

13. Intraligamentous fibroids, John F. Erdmann, New York.

14. Advanced ectopic gestation with living child, with report of three cases, X. O. Werder, Pittsburg.

15. Extrauterine pregnancy, H. E. Hayd, Buffalo.
16. Ectopic gestation, Charles L. Bonifield, Cincinnati.
17. Some old fallacies in retroversion surgery revived, Albert Goldspohn, Chicago.
18. Treatment of typhoid fever perforation, John D. S. Davis, Birmingham.
19. Placenta succenturiata, with report of two cases, Edward T. Abrams, Dollar Bay.
20. Repair rather than removal of the internal generative organs of women, J. Egerton Cannaday, Wheeling, W. Va.
21. Factors of safety in abdominal operations, based on operations, George W. Crile, Cleveland.
22. A simple, certain and universally applicable method of preventing the serious accident of leaving a sponge in the abdomen, H. S. Crossen, St. Louis.
23. Acute pancreatitis, with report of case, Louis Frank, Louisville.
24. Postoperative hiccough, Edward T. Abrams, Dollar Bay.
25. Removal of fibroid tumor from the pregnant uterus, William J. Gillette, Toledo.
26. Disorders of the female bladder, Ramon Guiteras, New York.
27. My experience with the Gilliam operation, William H. Humiston, Cleveland.
28. Typhlitis, John A. Lyons, Chicago.
29. Remarks on myoma of the cervix uteri, with presentation of specimen, Francis Reder, St. Louis.
30. Arteriosclerosis of the uterus, Charles M. Rees, Charleston.
31. Injuries of the bladder occurring during hernia operations, Roland E. Skeel, Cleveland.
32. Abscess of Gaertner's canal, with report of a case, Magnus A. Tate, Cincinnati.
33. Hysteria as the surgeon sees it, Ap. Morgan Vance, Louisville.
34. History and treatment of uterine fibroids, A. Vander Veer, Albany.
35. Fallacy of purgation, Edwin Walker, Evansville.

The following-named Fellows have promised papers, the titles of which have not been supplied as yet: John Young Brown, St. Louis; Henry Schwarz, St. Louis; Frederick Blume, Pittsburg; Walter B. Dorsett, St. Louis; Thomas B. Eastman, Indianapolis; Carlton C. Frederick, Buffalo; H. S. Griffin, Hamilton, Ont.; W. D. Haggard, Nashville; Rufus B. Hall, Cincinnati; C. S. Hamilton, Columbus; H. W. Longyear, Detroit; L. C. Morris, Birmingham; John B. Murphy, Chicago; L. S. McMurtry, Louisville; H. O. Pantzer, Indianapolis; Joseph Price, Philadelphia; Charles A. L. Reed, Cincinnati; M. Rosenwasser, Cleveland; F. F. Simpson, Pittsburg; Sigmar Stark, Cincinnati; William H. Wenning, Cincinnati.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

TREATMENT OF OTITIS MEDIA COMPLICATING SCARLATINA AND MEASLES.

BY

EDMUND PRINCE FOWLER, M. D.,

New York City.

THE prevailing opinion regarding the treatment of otitis, postscarlatinal, postmorbillus or concomitant with these diseases, would seem to be that it is identical with the treatment of otitis occurring as a separate entity. Whereas, in a general way this view is correct, I must dissent from it in many important particulars. In the first place, we are dealing with a condition which by long experience we have learned is very apt to be present during the course or convalescence of scarlatina and measles, and, therefore, we have been fully warned of its likelihood to supervene and so forearmed for combating its ravages.

In uncomplicated otitis we are seldom permitted to watch and guard against the onset. Duel (1), in a review of 6000 cases of acute infectious disease at the Riverside and Willard Parker Hospitals, found suppurative otitis present in 20 per cent. of the scarlatina cases, 10 per cent. of the diphtheria cases and 5 per cent. of the measles cases. It was more apt to occur in scarlatina during the second or third week of the disease and mastoiditis occurred with greater frequency than in measles or diphtheritic otitis. In the latter the ear disease usually had its onset during the acute stages.

In cases where any two of these exanthemata coexisted, otitis occurred in 50 per cent. and the infection was prone to be bilateral and involve the mastoid process. The middle ear is always more or less implicated in measles and in 8 per cent. followed by chronic suppuration. Twelve per cent. of all chronic middle-ear suppurations and many cases of deaf-mutism are directly due to scarlet fever (Burkner).

Baader (2) states that in fifty-one cases of scarlatina 25 per cent had ear trouble.

Schwartz (3) says that 22 per cent. of all ear diseases are purulent.

Burkhardt and Merriam (4), in 1000 cases of ear disease, found between 43 and 55 per cent. the result of scarlatina and in an epidemic of scarlatina from 22 to 33 per cent. had otitis.

In tabulating 1000 consecutive cases at the Manhattan Eye, Ear and Throat Hospital, I was startled to find 333 of purulent otitis media, and of these 133 involved both ears, 95 the left and 105 the right ear alone.

Statistics are usually dry reading, but surely the foregoing cannot but arouse our attention and our best endeavors to put a stop to this deplorable state of affairs.

It is usually through neglect that chronic suppurative otitis supervenes, although there are cases which seem to have a chronic character from their incipency. This is especially noticeable in the tuberculous and weakly. From the debilitating effects of measles and scarlatina, their complications and sequelæ, a fertile field is presented for the sowing and fertilization of the bacteria of tuberculosis, the chronic inflammations and suppurations.

In a study (now under way) of Calmette's oculo-tuberculin reaction in fifty cases of acute and chronic suppurative otitis media, I found twenty-nine chronic cases of one or more months' standing giving, with but two exceptions, a positive reaction to the test. Both of the negative results were in infants about eighteen months old. I cannot at this time go into this more deeply, but I give the data feeling sure that at least it will tend to impress us with the necessity of prophylaxis—the ideal treatment of otitis as of all baneful processes.

Now, what are some of the reasons for such a high percentage of cases of ear disease in measles and scarlatina? One of the most potent is pathological adenoid and tonsillar hypertrophy, which occurs, according to Killian, in 40 per cent. of patients with ear disease. The New York Department of Health has found that among nearly 200,000 children from five to fifteen years of age, 60 per cent. were undernourished; 40 per cent. had bad teeth; 38 per cent. suffered from enlarged cervical glands; 31 per cent. had defective vision; 18 per cent. enlarged tonsils; 10 per cent. postnasal growths.

It stands to reason that this rather understates the true condition of affairs, for these statistics were taken mainly from among school children, and did not include great numbers, who

on account of poor health and squalid surroundings were unable to attend school.

In these tonsil and adenoid cases the mucous membrane of the nose is usually hypertrophic, so that insult is added to injury and the poor Eustachian tube does not get much ventilation. See to it that your children are free from mouth-breathing, and obstructions in the nose and naso-pharynx which interfere with the physiological action of these passages, and if the hypertrophy of the inferior turbinates does not quickly subside on correcting the other deformities of the nose and throat, lose no time in applying adequate treatment. Do this before the little patients come down with scarlet fever and measles, for if you neglect it the added inflammations accompanying these will with difficulty be thrown off, and among other complications otitis will probably supervene.

I believe that some of our children are beginning to suffer of late from too much opening of the windows on cold, damp nights, and that this is conducive to hypertrophic rhinitis and the enlargement of the lymphoid ring of the pharynx and naso-pharynx. Common sense should prevent our foolishly subjecting children to needless exposure.

Halzinger (5) suggests that normal osmosis in living cells constitutes a sort of natural immunity, bacteria not finding such cells suitable for their growth, and that when for any reason the osmotic processes are checked, the germ can then proliferate unhindered. Osmotic processes in living tissues can be checked, temporarily at least by any form of traumatism, dryness of tissues, obstruction of emunctories or chilling of the parts. Whether or not this is accepted, in my experience treatment which tends to maintain or re-establish normal osmosis, tends also to prevent or cure disease.

Having attended to the foregoing or not, but being on the lookout for a probable otitis media, what measures should we employ, and how and why should we use them during the course of the diseases in question?

All treatment which tends to mitigate the primary disease will tend also in some measure to prevent complications. In measles the prevention of complications and combating individual symptoms, in the vast majority of cases, is the most important part of the treatment. Attend to it that dust-laden air, smoke, sudden changes of temperature, direct draughts and foolish exposure to cold and damp night air do not occur. Keep the room tem-

perature about 60 to 65° F. and the air moist to prevent the mucous membranes of the mouth, throat, nose, naso-pharynx and nearby structures from irritation, and from catching cold in the incubation and prodromal stages.

Put the patient to bed and keep him there until the desquamation is over, about ten days in measles and four weeks in scarlatina, as this will be of benefit not only to the sick one, but to possible contractors of the infection, for it will insure a more rigid quarantine.

Use all the general and special means which, by experience, you have learned tend to mitigate the disease and its many complications: Milk and light farinaceous foods. Bread, butter, vegetable soup, etc. Wet packs or tepid sponging to diminish temperature. Vaseline or such like during desquamation.

Put snugly about the neck a moist compress and cover with a dry cloth or rubber tissue. In my experience, if this is reinforced by properly adjusted elastic webbing, so as to slightly constrict the superficial venous channels and produce hyperemia somewhat after the method of Bier, it is not only of real use in limiting and curing inflammations of the nose, throat and ear, but of inducing a sense of quietude and well-being in the patient, alleviating distressing sore throat or any head pains and sleeplessness. Especially care for the toilet of the mouth, throat, nose and eyes.

Encourage the child to blow the nose frequently and clear it of secretions, being careful that but one nostril at a time is compressed and that clean handkerchiefs are used. This failing, and where the patient is too young to execute the maneuver successfully, make use of gentle inflation into one nostril, the other remaining open, by means of the ordinary Politzer bag. If care and discretion are used in this procedure, it will be found remarkably efficient and safe, except in cases where we have reason to believe there is an incipient inflammation of the ear-channels. Some recommend its use even under these circumstances. For the coryza and sneezing use instillations of 1 to 3 per cent. borovaseline into the nose, but if the catarrh is severe, tampon alternately the nostrils two or three times a day with cotton saturated with 1 per cent. cocain or with weak adrenalin and, as soon as the nose is free, use a spray of albolin or other fine, soothing oils. Two per cent. yellow precipitate ointment is highly recommended by some. Avoid powders and irritants, such as menthol.

Protect the skin about the nostrils and lips with glycerin, lano-

lin, etc., to which may be added 1 to 3 per cent. boric acid. The nose involvement in scarlatina usually sets in on the third or fourth day and, besides obstructing breathing and interfering with the ventilation of the tube, causes dry mouth and sleeplessness.

Swabbing or some form of douching are the best means of cleansing or disinfecting the throat, and the simplest and most agreeable method is to permit the swallowing at frequent intervals of pure cool water; or lemon water, marshmallow or sage tea and other demulcent and refreshing beverages. If indicated, use gargles and draughts of 1 per cent. potassium chlorate, and tinc. ferri. chlorid, glycerin, etc., 1 per cent. hydrogen peroxide.

These simple measures, if carried out intelligently, will not only combat the dry mouth, fever and sore throat, but will be of great service in preventing or mitigating numerous other symptoms and pathological processes. I believe the frequent swallowing of fluid or semifluid potions is a real aid in cleansing the tonsils of infectious material, in that with every deglutition, besides the flushing of the throat and cleansing, the tonsils are firmly gripped between the pharyngeal muscles and the crypts more or less milked, as it were, of their contents. I believe, also, that the frequent draughts tend to maintain a more patent Eustachian tube and hence a normal tympanic cavity. This is due to the fact that with every deglutition the walls of the tube, which at rest are in apposition, are drawn apart and, unless unduly obstructed, air is permitted to enter. If the act of swallowing does not accomplish its purpose in this respect, the gentle use of the Politzer bag, recommended for the purpose of clearing the nose, will be of service.

In infants, the Eustachian tube is large and has a wide, funnel-shaped pharyngeal aperture, hence it presents an easy access for infectious material and likewise an exit for secretions into the throat; these facts partly account for the lack of earache so often noted in infants. It furthermore impresses us with the necessity of attending to nasal, postnasal and pharyngeal catarrhs in their incipiency.

Studies by numerous investigators indicate that in the great majority of cases the streptococcus pyogenes inhabits the throat and tonsils of scarlatina patients in far greater numbers than in health, that with convalescence they gradually disappear, that the otitis is caused by the bacteria of suppuration, and not by

the antecedent disease, and that the degree of systemic infection largely determines the number of bacteria present.

In five cases of postmorbillus otitis, all occurring in the same family, pus taken from the depth of the meatus, as well as from the antrum and mastoid process in three of them which went on to operation, contained the same staphylococcus. Baer (6) declares that the purulent otitis at the end of the second week of illness seems to speak much against the universal view that measles otitides are caused by the primary exanthem.

In scarlatina, as the signs of general infection are preceded by a sore throat, the tonsils are probably the primary seat of localization and streptococci are regularly found thereabouts. From thence the infection spreads through the lymphatics to regional nodes, and by direct extension over the mucous membranes of the nose and naso-pharynx and by way of the Eustachian tube to the ear and neighboring structures.

The circulating blood may also become infected and streptococemia result, as well as inflammations in various parts of the body. In fatal scarlatina general streptococcus infection is demonstrable after death in the vast majority of cases.

In scarlet fever, affections of the nose and ears are of prognostic significance, and the otitis is apt to be proportional to the severity of the exciting cause—the general disease. If the nose be not involved, the ear will probably also escape. Hence it is that we expect a serous nasal discharge and a tubal catarrh or catarrhal otitis in the milder exanthemata, such as measles, and a change to purulency only if infection occur from without, as after rupture of the drum. Whereas, in the severe exanthemata, such as severe measles and scarlatina, the infection is more virulent, the nose is occluded with a thick, muco-purulent discharge which irritates and excoriates the nostrils, and the otitis involves the deeper tissues, especially in the vault. A cellulitis results, which runs a course typical of such an inflammation in any part of the body, and we speedily have necrosis and pus, early disorganization of the bony structures and chronicity. The drum sloughs easily and in three days may be completely destroyed, especially in otitis occurring before or during the eruption in scarlatina. The otitis may occur without rhinitis.

With the onset of complications or with a change from a so-called catarrhal to a suppurative inflammation, we usually note an abrupt change in the clinical symptoms: prostration and especially a rise in the temperature occurs. It is, therefore, most

important regularly to take the temperature in measles and scarlatina not only in their acute stages, but throughout convalescence. In scarlatina, six weeks is not too long to continue this, as I believe in children we always get a febrile reaction with an acute otitis and with a change from a catarrhal to a suppurative inflammation. Pain is frequently absent or slight and in the early stages it is impossible to determine whether we are to deal with a suppurative process or not. We are prone to think the case will turn out milder than it proves to be.

The diagnosis of otitis must not be left to the patient, as so often happens, but at every visit we should inspect the drum membranes and note any beginning inflammation thereon reflected. On account of the scarcity of hair in the meatus, the large size of the canal and the superficial situation of the drum in children, it is often easier to inspect the latter without a speculum than with one. On detecting an involvement of the middle ear, I usually proceed at once to give calomel, gr. one-tenth, every half-hour, for ten doses; to produce diaphoresis by hot drinks, Dover's powder or other remedies, and to irrigate the canal of the ear with hot bichlorid, 1-5000, or boric acid and normal salt solution at 110° F.

Irrigate every two hours with two quarts of fluid, and by means of a suction-bell douche, induce thus a combined hyperemia in the tissues with all that this implies. This suction-irrigation mitigates or dissipates the earache and in many cases will abort the attack.

Guard against premature incisions of the drum, but be on the alert and, with the first positive sign of confined pus in middle ear or mastoid, incise freely the tympanic membrane. Also incise in very doubtful case, especially if there has been no improvement in symptoms in two or three days, or violent pain for even one night with a rise of temperature to over 100° F., or when there is slight bulging of the drum membrane with swelling and tenderness over mastoid process.

Meningeal symptoms or tumefaction in the posterior superior wall of the external auditory canal near the drum demand prompt incision. Almost invariably the first signs of suppurative inflammations appear in the membrana flaccida, as it is in this locality that the connective tissue is abundant, and many reduplications and recesses abound.

The advantages of incising the drum instead of permitting it to rupture are many, and of any single procedure this is the

most important in acute suppurative otitis media. It usually at once relieves the pain, lowers the temperature and prevents liability of extensions of the inflammation. It establishes more efficient drainage and tends to bring about a quicker cure with less loss of hearing than spontaneous rupture. It permits of the cleansing and sterilization of the canal, and so guards against a mixed infection and its accompanying evils. Especially in children, if there is no evacuation by rupture of the drum or by incision, the pus is very apt to dissect off the tissues lying along the supero-posterior wall of the meatus and appear behind the ear as a fluctuating swelling, since the periosteum in this locality is loosely attached and continuous with Shrapnell's membrane and the drum is superficially placed. Naturally, mastoiditis is common in these cases and, in fact, is usually present before such a condition is apparent.

If examination of pus from the middle ear shows the presence of streptococci, do not delay further operative measures if symptoms of mastoid involvement appear, for with virulent organisms delay is fatal if we would avoid further serious complications. If staphylococci or other less virulent bacteria are found, milder measures stand a better chance of aborting the impending inflammations.

Drainage having been established, it behooves us adequately to maintain it, and failure so to do is the cause of the great number of chronic suppurative cases and losses of hearing. I believe the best way to accomplish this difficult task is to draw all inflammatory material to the surface of the suppurating tissues by means of sufficient suction. This brings the purulent matter, bacteria, toxins and detritus into a position where irrigating fluids may eradicate them from their hosts. It diminishes tension, prevents the spread of the infection, washes out the deeper tissues with blood-serum and brings to the parts a fresh supply of blood. If the suction and the irrigation can be combined, I believe we have a very efficient means of obtaining satisfactory and speedy results. This my apparatus accomplishes in a simple, safe and efficient manner. Such a combination also does away with objections to either method used singly.

My ideas of the management during the declining or chronic stages of suppurative otitis are based mainly on the results obtained by use of the suction douche and various aids to its action. These procedures being similar to those used in the treatment of uncomplicating otitis media, I will not take them up here.

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- 57 WEST SEVENTY-SIXTH STREET.

 CONGENITAL PYLORIC STENOSIS.*

BY

W. CARL SCHOENIJAHN, M. D.,

Brooklyn, N Y.

Consulting Pediatricist to Samaritan Hospital; Assistant Visiting Physician to Norwegian Hospital.

THE interest in this subject depends not only on the comparative recency of its recognition and study, but also upon the probability that frequent errors in diagnosis are due to overlooking the condition. How many cases of inanition and death ascribed to other causes are really dependent upon a congenital obstruction at the pylorus, it is impossible to know. There is no doubt that in the past many cases have never even been suspected, the diagnosis being by no means always simple, and the pathological condition one which, I believe, is too seldom looked for. A child that has thriven at the breast for a period of five weeks or more we ordinarily consider as having had a fair start in life and expect it to do well, yet often the condition we are discussing gives no evidence of its existence until a month or more has passed.

Congenital pyloric stenosis has been generally recognized only during the last few years, and although an increasing number of cases are reported, there is considerable diversity of opinion concerning its pathology and treatment. In the *Brooklyn Medical Journal*, May, 1903, Dr. Frank Shaw collated the records of between thirty and forty cases. Since then the condition has been more frequently recognized, so that to-day about 175 cases have been reported.

Males are more often affected than females in the proportion of about four to one. No explanation has been offered for this fact.

* Read before the Norwegian Hospital Alumni Association.

More than one child in a family has been a victim of the affliction; but this is true of all congenital conditions.

A consideration of the varying opinions regarding the advisability of operating as soon as the diagnosis is established or of temporizing, leads one to accentuate the fact that there are two pathologic conditions present, the results of treatment depending largely upon which of these predominates in the given case. These factors are:

1. The hypertrophy; an abnormal muscular development of the pylorus, particularly of the transverse fibres; this alone being the congenital condition.

2. The spasm; a tonic contraction of these increased fibres.

The latter factor is, theoretically, due to an irritation of the hypertrophied tissue, and in a measure explains the delay in the appearance of symptoms; for until such irritation occurs the stomach may have sufficient motive power to force the food through the narrowed orifice. As the quantity taken at a feeding increases with the child's age, the stomach gradually loses its reserve force, and at the slightest provocation pyloric spasm occurs and symptoms of motor insufficiency present themselves. Even at this stage apparent recovery has been noted by careful observers, the stomach regaining its power and the spasm relaxing. Americans claim there can be little doubt that these cases of recovery have been simple spastic forms of obstruction with no hypertrophy.

The lesions found in the true cases are fairly uniform. The pylorus is elongated, much thickened, hard, and as Holt puts it "projects into the duodenum like a cervix uteri." The feel of the hypertrophied muscle is like that of a horse-chestnut under the tissues. The orifice is greatly diminished, sometimes hardly admitting a probe. Marked thickening of the circular fibres is the most striking microscopic change.

The symptoms occasionally appear in the first days of life, but it is far more common for a considerable period of absolute good health and normal growth to pass, with no digestive disturbance until the appearance of the cardinal symptom—vomiting. At first there is nothing alarming in this, but it soon becomes too persistent for any ordinary condition, the infant rejecting not only breast-milk, but even plain water. In the absence of bowel symptoms such vomiting should at least be suggestive of the serious condition under consideration. Vomiting may come on immediately after nourishment or water is taken, or

may be delayed for an hour or longer. In some cases all the liquid taken is rejected, in others only a portion. As stomach dilatation is a natural consequence of the condition, it may result that in the later stages the vomiting occurs at longer and longer intervals, so that at times the stomach empties itself of a large quantity—the aggregate of four or five feedings. The vomiting occurs without effort or exciting circumstance, often while the infant is sleeping, and the rejected material is simply the milk, changed according to the time it has been in the stomach. Occasionally there will be some mucus, streaked sometimes with blood. Bile is not present in the vomitus.

A rapid and progressive loss of weight, with constipation, are the next most important symptoms, both depending upon the amount of food which can pass into the bowel from the stomach. The condition being purely mechanical, there is no fever.

Examination of the infant's abdomen shows a striking prominence of the epigastrium as compared with the retracted abdomen below. The ingestion of food starts normally a peristaltic wave, and in the condition we are considering these waves are an important and fairly constant diagnostic aid. If emaciation is at all advanced, the peristaltic wave of the dilated stomach can be seen in an exaggerated effort to overcome the obstruction offered by the closed pylorus. If the light be good, these waves can be seen to pass from left to right across the epigastrium, disappearing at the edge of the liver. Occasionally the thickened pylorus is appreciable as a tumor slightly to the right of the median line; but this is only in about 20 per cent. of the cases.

Prognosis.—A number of foreign authorities claim to have witnessed spontaneous recovery in a large percentage of these cases, but our own observers by no means agree with this view, claiming that owing to the difficulty of exact diagnosis much misconception has arisen. As a rule, unless relieved by operation, death follows increasing inanition, the vomiting persisting to the end. Boardman Reed says that the deformity is almost inevitably fatal sooner or later unless surgical intervention is invoked. He goes on to remark: “* * * obstinate vomiting in an otherwise healthy and carefully fed infant should awaken your suspicion that a congenital stenosis of the pylorus may exist, and if the vomiting persists for weeks, in spite of treatment, or frequently recurs without ascertainable cause, an exploratory incision may properly be advised. The risk of this is small, and the pyloric stenosis not operated is inevitably fatal in the end.”

Treatment.—Owing to the evident impossibility of correct diagnosis until the case has been under observation for some time, the early treatment must be that of persistent vomiting, namely, stomach-washing and careful feeding, to avoid irritation of any kind. As all fluids taken by mouth are rejected, saline enemata are to be given regularly to furnish fluid to the tissues. Nutrient enemata cannot be used for any length of time. Stomach-washing should be practised at least once and possibly twice a day if not too exhausting to the patient. Feeding should be at regular two- or three-hour intervals in spite of the vomiting, either with human milk or, if this is unavailable, peptonized skimmed milk, diluted one part to three. Since the fat does not reach the intestine to be utilized, and by remaining in the stomach too long will cause butyric acid fermentation and make matters worse, skimmed milk is advised.

Operative Interference.—The consideration of the question of operative interference places us between the horns of a dilemma. If we wait too long, operation is bound to fail because of lack of vitality, while when we regard the seriousness of operating, even under favorable conditions, we are, as conservatives, deterred by the statement that some of these cases recover without such measures. According to most writers, only about 25 per cent. of cases operated upon will recover, though a few can show better results. Yet operation is always a thread of hope in cases which do not promptly show improvement under the treatment outlined. Even after successful operation, an unpromising period must follow, since the difficulties of feeding become almost monumental. For months the food must be wholly or partially predigested, inasmuch as the artificial pylorus permits nutriment to pass undigested into the intestine and enteritis is otherwise sure to follow.

Pyloroplasty and anterior gastroenterostomy seem to give the best promise of any of the operative measures. Loreta devised a procedure which bears his name, opening the stomach and attempting to divulse the pylorus with forceps through this opening.

Dr. G. F. Thompson reports a total of eighty-nine cases operated upon. Pylorotomy was done once, with fatal result; pyloroplasty, twelve times, with six recoveries; divulsion, seventeen times, with eight recoveries; gastroenterostomy, fifty-nine times, with twenty-nine recoveries. To this number add three cases I have found, including my own, of gastroenterostomy, two

of which recovered. This gives us a total of ninety-two operated cases, with forty-five recoveries, about 54 per cent.—a showing for such an otherwise hopeless condition which must be applauded.

The details of the case under my care are as follows:

R. N., male, born October 5, 1906. A forceps delivery after prolonged labor. Weight at birth, eight and one-half pounds. Absolutely normal in appearance. The mother developed a septic fever and was unable to nurse the boy, but he did remarkably well on top-milk feeding, the bowel movements remaining normal up to a few days before the first symptoms of obstruction appeared, when there was slight constipation. On the twenty-seventh day following his birth the first vomiting occurred, and it was surmised that some ordinary ailment was the cause. Absolute constipation was a marked condition from this time on. Food was stopped at once. A teaspoonful of castor oil was vomited after an hour. Calomel triturates had no influence. Plain water and lime-water would remain an hour in the stomach and then be rejected with a little mucus. It was this fact, that apparently nothing was leaving the stomach by way of the intestine, since constipation was pronounced and bowel-washing negative, which first suggested some form of intestinal obstruction. On the fourth day after the onset of the vomiting the diagnosis was established by the loss of weight, the empty intestines and the very evident peristaltic waves. No tumor was evident. The stomach was then washed once or twice a day, salt-water enemata given three times daily, and every six hours a nutrient enema of two ounces of peptonized milk with egg albumin. The bowels would occasionally pass a small spot of bile-stained mucus, brown or green. Following the regular employment of stomach-washing, the organ seemed to regain a certain tolerance. Sometimes as much as three feedings would be retained—once or twice even four feedings—lending a ray of hope that some improvement had been made; but eventually all would be returned in a quantity seemingly impossible for so small an infant. For eight days the temporizing methods continued with a steady though slow loss in weight, so that in consultation with Dr. L. Emmett Holt, operation was determined upon. On the fourteenth day after the onset of symptoms, with the patient still in fairly good condition, weighing six and one-half pounds, when the weight at birth had been eight and one-half, a gastroenterostomy was done. The pylorus was seen to be

much thickened and the intestines below flat and empty. The stomach was dilated to about twice the normal size for the age of the baby. Following operation, the bowels moved and the vomiting was less and less persistent, so that some hope of success was entertained. Four days later, however, the patient died, as far as I could determine, from exhaustion.

822 Union Street.

REFLEX NEUROSES IN CHILDREN.*

BY

THOMAS S. D. GRASTY, M. D.,

Washington, D. C.

At birth the weight of the brain to that of the body is nearly 1:8; during the first year, 1:6; during the second year, 1:14; during the third year, 1:18; during the fourteenth year, 1:15 to 1:25, and in adults about 1:43. This relatively large size and the rapid growth and immaturity of the brain and cord during early life explain much that is peculiar in the nervous diseases of this period. During childhood, apparently trivial causes are enough to produce quite profound nervous impressions because of the instability of the nerve-centers and the greater irritability of the motor, sensory and vasomotor nerves; these are conditions which are much increased by all disturbances of nutrition.

Another peculiarity is the serious consequences which often follow reflex irritation; conditions which in adult life produce almost no effect may in infancy and childhood be the cause of most alarming symptoms.

The object of this paper is to call to mind some of the common nervous conditions in childhood not dependent upon any organic lesion but upon an irritation acting through the reflexes, sometimes producing violent and distressing symptoms which are quickly and completely relieved by the removal of the cause.

We are much more likely to meet with nervous phenomena of diversified types in children than in adults, together with the most widely differing symptoms—symptoms which, if occurring in adults would be significant of serious lesions of the nervous system, may and do arise in children from simple reflex conditions which only simulate and do not represent actual disease.

Children are much more apt to become unconscious, to have

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convulsive attacks and to show disturbance of the functions of important nerve-centers from reflex irritation than are adults. The whole cerebrospinal system in infancy and childhood is so impressionable, so excitable, and so hypersensitive to even slight grades of irritation that diseases of a nervous type dominate others.

Instability and irritability of the nervous system, both peripheral and central, are characteristic of the early periods of development, making certain nervous diseases of children peculiar to them as compared with adults.

A simple heightened temperature or increase in the vascular pressure in the brain and cord may cause such irritation of the nerve-centers that the most varied symptoms, such as delirium, somnolence, twitchings and even convulsions.

In the production of some of these there are several factors, such as the great irritability of the peripheral nerves, the instability of the nerve-centers—often the result of disturbed nutrition—and the lack of inhibitory action of the cortex of the brain; the nerve-centers are more easily exhausted than in later life.

A normal development can only take place in the midst of peace and quiet with plenty of time for rest and sleep. The conditions of modern life, especially in cities, are such that these laws are almost invariably violated, and the results are seen in the marked and steady increase in nervous diseases among children. As an etiological factor in all such neuroses of reflex origin, faulty hygiene, too arduous school duties and poor nutrition play a most important part, and it is essential for a healthy development of the nervous system that all stimulants should be avoided, not only tea, coffee and alcohol, but also undue and unnatural excitement, the effect of which in infancy is almost as serious.

A really normal pharynx in an adult is rare; an edematous uvula or hypertrophy of lingual lymphatics may give rise in a child to an irritative cough, nocturnal enuresis may occur, this may be explained by the accumulation of carbonic acid gas in the brain dulling the sensory nerves so much that the irritation ordinarily attending accumulated urine is insufficient to give warning to the sleeper and unconscious relaxation of the sphincter results; frequent diurnal micturition is similarly due to imperfect cerebral nutrition resulting in constant irritation of all reflex centers. Hysterical dyspnea may be caused by tonsillar

fragments acting as a foreign body, initiating spasmodic contractions of the diaphragm.

Tonic and clonic convulsions as well as headaches may be caused by the toxins, elaborated by the throat fungi. St. Vitus's dance results—the association of this disease with rheumatism has often been commented on, both having been often observed accompanying or following an acute angina. Lymph stasis and venous stasis at the base of the brain of “mouth breathers” with impairment of the nutrition of its cortex and membranes is conducive to epilepsy.

It has been stated before that “who can say that the psychoneurotic prodigy Joan of Arc was not obsessed by the mysterious whispers of catarrhal drum retraction and not by angels' voices?” also, “was not Beethoven pursued and hounded to his death in the horrible silence of total deafness by a single tone all powerful, overwhelming, on which he built imaginary concertos and symphonies?”

Convulsions of peripheral or reflex origin are very common in infancy and childhood and have so many different causes that it would be impossible to name them all. Convulsions of this class may arise from almost any source in children whose nervous systems are so easily irritated that the slightest cause may produce a nervous explosion. The disease which gives rise most commonly to reflex convulsions is rickets; rachitic children seem to be predisposed to spasmodic attacks of all kinds; a general clonic convulsion in a child with rickets, corresponds to the spasmodic contraction of the larynx, which also occurs in rickets, spoken of as laryngospasmus.

The most common cause of reflex convulsions is, of course, improper food and may arise not only when indigestible articles of food are given to young children, but may be produced even in nursing infants by a disturbance of the mammary function. I do not credit the physiological eruption of teeth as sufficient cause to produce any marked disturbance. Other causes of eclamptic attacks are intestinal parasites, foreign bodies in ear and nose, fright, shock, etc.

Habit chorea or habit spasm is probably the very best example of a purely reflex neurosis and affords such striking results from removal of the offending cause. This condition is due to reflex causes of many kinds—eye-strain, nasal disease, binding or irritation of some part of the body by clothing, phimosis, seat worms, deformation in speech mechanism, as tongue-tie, enlarged

tonsils or adenoids, or anything interfering with the functioning of an unstable nervous system; thus a boy with this predisposition, upon putting on his first pair of suspenders, may develop shoulder twitching, or the child with tongue-tie may begin a contortion of the neck induced by the endeavor to speak properly, or blinking of the eyes may result from an uncorrected astigmatism.

Overtaxing the central nervous system during the school year has often been shown to result in an attack of chorea in the spring (Ewald and Witte, in the *Berliner Wochenschrift*, Jan., 1908 report a case of acute chorea appearing as a complication of severe gastrointestinal disease).

There is probably no condition or symptom-complex so varied that it may not be simulated by some reflex condition manifesting itself in a child; hence a complete enumeration of all neuroses dependent upon a disordered nervous system and an unstable reflex arc would be impossible. I simply desire to call attention to them in a general way and to urge a more careful examination of children presenting themselves for treatment in order to rectify all sources of peripheral irritation and so rapidly bring about a cure.

Tetany, night terrors, catalepsy, tremors, gyrospasm, nystagmus, laryngismus stredulus, paroxysmal gasping, reflex cough, cardiac palpitation and enuresis (which in children is a pure neurosis, and not as a rule due to muscular weakness of the sphincter) all are dependent upon some functional or peripheral irritation.

Reflex disturbances from the genital tract can be traced by continuity; the greater number of neuroses observed in gynecological practice are to be assigned rather to degenerative hysterical groups than to typical hysteria. The history of the patient and the typical minor lesion, coupled with the major complaint, will settle the diagnosis.

There is also a large class of gastric disorders which must still be regarded as functional, which are commonly described as gastric neuroses; most of these are at present without any discernible anatomical alteration, and their existence seems wholly dependent upon a strong neurotic taint, such as cardiospasm, pylorospasm, rumination, bulimia, etc. [In *J. A. M. A.* April 18, 1908, Dr. Taylor, of New York, reports in a school-boy a case of transient heart block due to gastrointestinal toxemia.]

The treatment of this entire class of diseases is simple, the hygiene of the nervous system in infancy is of utmost importance,

each child is an individual, each nervous system separate and distinct, each must be guarded and cared for differently—plenty of outdoor air, proper food, rest and quiet, sufficient sleep, the careful avoidance of overwork at school, careful examination of upper air-passages and removal of tonsils and adenoids, all eye and ear defects recognized and corrected, examination of stools, and urine with the removal of any parasites present, care of phimosis or adherent clitoris, together with tonics, constitute the treatment, and in no class of diseases do such rapid and permanent results occur as in this; the use of sedatives is mentioned only to be condemned.

In that ulterior day (I copy from Dr. Ross Allen Harris, of California), when men shall no longer in home and mart and highway think only of acquisition and profit, but of health and right, when a good name shall be more diligently sought for than great riches, when the science of medicine shall become prophylactic instead of symptomatic, then shall the hysteric and the neurotic receive their meed of thought and care. Then shall these functional diseases no longer be allowed to develop into organic lesions, and epilepsy and insanity shall be as rare as variola and cholera.

1273 N. HAMP. AVENUE.

SYPHILIS IN PREGNANCY AND EARLY INFANCY.*

BY

A. B. MORSE, M. D.,

Washington, D. C.

THE baneful effects of syphilis in pregnancy have long been recognized. The syphilitic virus is one of the most active and persistent causes of abortion and miscarriage. The difficulties in the way of gathering reliable information in matters so obviously private and delicate make it impossible to obtain accurate statistics on this most important subject. We can, however, form some idea of the part which syphilis plays in abortion by studying the comparatively accurate figures relating to the existence of syphilis and those which deal with abortion in general, especially the well-known causes of abortion, foremost among which syphilis stands. It has been estimated that from 10 to 20 per cent. of the adult male population of large

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cities is afflicted with syphilis. LeNoin and Fournier place it from 15 to 20 per cent. Manifestly, there is more syphilis in large towns and cities than in the country. In Europe the garrison towns show a very large percentage. All the conditions of life which compel crowding and unsanitary modes of existence favor the increase of disease. The figures on abortion vary, but all show the destructive activity of syphilis. Santare, in 485 cases of intrauterine death occurring in the later months of pregnancy in Pinard's clinic, found the underlying cause to be syphilis in 42.7 per cent. Fournier, Lassar and others consider the mortality *in utero* of syphilitic parents to be from 60 to 90 per cent. Thorrow says one-third of all children born syphilitic die before they reach the age of six months. The figures for hereditary syphilis are very high—80 to 90 per cent. of those treated die and the untreated perish uniformly. The fact that syphilis is a disease which may be transmitted to the second and third generations, and that frequently the people so afflicted are ignorant of any syphilitic taint, remaining untreated in consequence, probably accounts in large measure for the so-called "abortion habit" which seems to characterize so many women. As Williams very truly remarks: "When repeated premature labor has occurred in the second half of gestation, signs of albuminuria or Bright's disease or syphilis will usually be discovered." The fact now recognized that syphilis produces certain well-defined changes in the placenta (of which we will speak more particularly later) and which are distinguishable in part by careful inspection and otherwise by microscopical examination, makes it possible for the obstetrician to diagnose the existence of many cases formerly overlooked. Furthermore, as the consequences are of the greatest importance to the mother whether her offspring survive or not, it is obviously the duty of the physician to satisfy himself in any case of premature labor or miscarriage as to the real source of trouble that he may advise such treatment as may protect the woman and permit her ultimately to give birth to healthy children.

Syphilis may be transmitted by either parent. A syphilitic mother will infect her offspring as, in turn, the offspring may infect the mother. She may have syphilis prior to conception or the disease may be acquired after conception. The disease in either case will be well marked, but the consequences vary with her condition. An old, secondary syphilis which has been treated, even if it exist prior to conception, as a rule, does less harm than

recently acquired syphilis. The latter usually sets up such active changes in the blood-vessels and tissues of the placenta as to cause early death of the fetus and abortion. Here it would be well to state that syphilis of this description existing from the beginning or early in pregnancy is most destructive to tissue and the chances of the fetus are very bad. Syphilis acquired late in pregnancy affords a better chance for the survival of the child. Though tainted and sooner or later exhibiting signs of specific disease, the changes in placenta and cord are not sufficient to interfere with its nutrition to a fatal degree. These children are frequently born so plump and apparently well nourished that it is hard to believe the evidences of specific poisoning which develop within a few weeks. At the time of conception the mother may be free from disease and at no time exhibit any signs or symptoms of syphilis and yet give birth to a markedly syphilitic infant. Here the disease is transmitted from the father. Infection is supposed to be through the diseased spermatozoa direct to the ovum. This is the theory of Van Barendsprung. The degree of infection, the consequences to the ovum, will depend largely upon the virulence of the specific poison as determined by the stage of the disease and whether treated previously or not. The chances of the early death of a fetus and resulting abortion are, however, especially great, when the father, an old syphilitic, is the direct infecting agent, as the characteristic changes in the placenta and cord beginning at the earliest possible time soon reach a point where further nutrition and development of the fetus become impossible. That the mother, previously healthy, becomes infected through her own diseased ovum is now generally accepted by syphilographers. As long ago as 1837, the celebrated Dr. Colles, of Dublin, set forth in concise form certain observations of his which have been found true in every particular. This law of Colles is best given in his own language: "One fact well deserving attention is this: that a child born of a mother who is without previous venereal symptoms and which shows the disease when a few weeks old will infect the most healthy nurse, whether she suckle it or merely handle it and dress it, and yet this child is never known to infect its own mother, even though she suckle it while it has venereal ulcers of the lips and tongue." The most reasonable explanation of this seemingly contradictory condition of an apparently healthy woman bearing a syphilitic infant is that the woman is already syphilitic, having been infected by her own

diseased product. This is the "immunity" formerly attributed to the mother who, while in reality diseased, presented none of the outward and visible signs of disease. As Boulangier says, this is the true and logical explanation of Colles' law. Hyde and Montgomery, however, do not concur in this view and maintain that syphilis is transmitted only when the mother is herself diseased. Another opinion, the reverse of this, is that of Williams, who considers most cases of syphilis paternal in origin and transmitted by the spermatozoa. "In such cases the mother will or will not contract the disease, according as the father does or does not present infectious lesions at the time of coitus. Since these are usually absent, the fetus ordinarily becomes inoculated while the mother escapes," and on this basis he interprets Colles' law. The interesting question arises in this connection, when can we assure our syphilitic patients that their offspring will show no marks of contamination? Kerley says, "we can never promise a man or woman who has had syphilis that his or her children will be free from the disease." The syphilitic taint may be transmitted to the third generation. Fournier, whose rank as a syphilographer is of the highest, reports forty-five marriages of hereditary syphilitics in which forty-three abortions occurred in 145 pregnancies, thirty-nine infants being stillborn or dying soon after birth, or a total of eighty-two dead children, 56 per cent. The surviving children all showed specific stigmata.

Since the discovery, in 1905, by Schaudiner and Hoffman of the parasite called the spirochete pallida, the presence of which in many syphilitic lesions has been demonstrated, we have for the most part accepted this organism as the active cause of syphilis. The discovery lacks, however, the positive proof necessary for its complete acceptance. If it be what it is claimed, it will not be difficult to understand the rôle which it plays in the transmission of disease. Especially so in the case of the syphilitic mother. We know that the tubercle bacillus can and does pass from the mother to the child by way of the materno-fetal circulation. The investigations of Warthin and Cowie have demonstrated the tubercle bacilli in every stage of its passage by way of the syncytial layer of the placenta itself and the further presence of the bacilli in the organs and blood-vessels of the fetus. Arguing from analogy (and analogy *alone*), we may assume the specific organism of syphilis acts in a similar way, as it has been found in all syphilitic lesions of the mother and in the placenta. The proof of its actual transit is lacking. The

specific changes in the placenta largely depend the source of the infection, its character as to time, condition, etc., and may be described as both macroscopical and microscopical. The former show, first of all, a considerable increase in the size and weight of the organ. In normal conditions the placenta represents about one-sixth of the entire weight of the fetus. A syphilitic placenta is never less than one-fourth or even one-third. It is large, greasy-looking, pink or pale gray, and the surface more or less mottled, the result of hemorrhagic infarcts and patches of fatty degeneration. The so-called placental gummata, formerly described and supposed to be pathognomonic, are in reality not gummata at all, but only areas of fatty degeneration which were originally hemorrhagic infarcts. The changes in the cord appear as a thickening of all the structures with an irregular development of the blood-vessels. Bissell reports a case in which the cord three inches from the placenta was hard and inflexible, and another case in which the deposits in the cord were so thick as to occlude the vessels. The microscopic findings in specific placental disease show marked changes, chief of which are the hypertrophy of the villi and their extreme fragility. This change is the result of a cellular infiltration of the tissue and was first clearly described by Fränkel in 1873. The hypertrophy of the villi causes a complete alteration in their appearance, which has been described as club-shaped. At the same time the infiltration and hypertrophy of tissue causes a marked diminution in the number of blood-vessels. In numerous instances these have been found practically destroyed. This alteration in the blood-vessels is, in part, the result of an endarteritis, but as Williams says, due largely to round-cell proliferation. Wallick and Gerarditi found the spirochete pallida in the scrapings of one syphilitic placenta, as has been done by other observers. The death *in utero* of the syphilitic fetus is, in all probability, caused by the above-described changes which are of such a character as to destroy the glandular and functional work of the placenta, the nutrition and development of the fetus being arrested. The proper blood-supply by way of the cord is cut off through hypertrophy of tissue, which not only causes pressure and interference in circulation, but degenerative changes go on which ultimately alter its character altogether. This explanation of the persistent death *in utero* of the syphilitic infant is more reasonable than that which attributes it to the direct action of the syphilitic virus, and would seem to explain why

some unquestionably syphilitic children are born without mark and yet develop the disease within a short time. The description of Fränkel of changes in the placenta is summed up by him as follows:

1. When the disease has been transmitted by the father, the principal lesion is hypertrophy of the villi.
2. When the mother is infected with syphilis, the placenta is degenerated and the fetus diseased, the villi are filled with fatty granules, the vessels are obliterated and their epithelial covering is thickened or absent.
3. If the mother is infected during the generative act at the same time as the ovum, the syphilitic foci will often develop in the maternal placenta.
4. If the mother is syphilitic before conception, or becomes so shortly after, the placenta is syphilitic in about 50 per cent. of cases.
5. If the mother is not infected until after the seventh month, both fetus and placenta wholly escape.
6. Infection during delivery has not been proved.

A syphilitic placenta is apt to set up inflammatory conditions which cause it to become adherent to the uterine wall. This sometimes constitutes a serious difficulty after labor, when the removal frequently sets up a severe hemorrhage.

The stillborn infant is usually macerated. This is, in itself, nowise different from what is commonly observed in any stillborn fetus, which has remained some time *in utero*. The skin peels off, leaving a bleeding and excoriated surface. The liver is enlarged, likewise the spleen. On microscopical examination, the liver structure is found to have undergone changes, especially about the blood-vessels, lobules and acini. The connective tissue is increased to such an extent as to produce a cirrhotic hypertrophy. This condition is also found in the spleen, which by the increase of connective tissue is several times larger than normal. The same is true of the pancreas.

The most marked changes in the lungs are those which constitute the "white pneumonia" of Virchow. The lungs are large, completely filling the thoracic cavity, pale and do not float when immersed in water. As this is, however, true of many stillborn children, nonsyphilitic, it cannot be considered as pathognomonic of syphilis. The lungs show the imprint of the ribs; the bronchioles and air-cells are filled with epithelial cells; in some cases gummata have been observed.

At other times the lungs are of a deep red color—a great increase in connective tissue being the most marked characteristic. Similar changes are noted in the kidneys. Ascitic fluid in the peritoneal cavity marks a chronic peritonitis, and hydrocephalus may result from disease of the ventricles of the brain and inflammation of the meninges. One of the most significant signs of fetal disease as shown by autopsy is the osteo-chondritis described by Wenger. This is the uneven, yellowish line between the shaft and extremity of the long bones. Normally, this line—Guerin's line—is a narrow, whitish line from $\frac{1}{2}$ to 1 mm. in diameter and, as Williams says, marks the area of preliminary calcification from which the new bone springs. In syphilis this is converted into a jagged, yellowish line, several times the thickness of the normal. The lower ends of the femur, tibia, and radius exhibit these changes best. The living syphilitic infant may present such an array of specific signs as to leave no doubt regarding the diagnosis, or it may at birth appear well and healthy, later to develop signs which may be unmistakably syphilitic, or which may at all times be indefinite and obscure. The symptoms of syphilis are many. A markedly syphilitic infant has the look of a sickly, ill-nourished infant. The skin is pale, flabby, yellowish or ivory-tinted and may be marked by an eruption or not. There is usually an absence of subcutaneous fat and the flabby, ill-nourished skin is very prone to develop eruptions—usually blebs which break, leaving a raw and bleeding surface beneath. The skin may be so loose as to hang in loose folds (Jabowski's sign). The hair thick, coarse and standing out has been termed by English writers the "syphilitic wig." The skin of the palms of the hands and soles of the feet are puffy and ultimately break down in ulcers. Excoriations about the anus, the angles of the mouth and nose add much to the diseased aspect of the wretched infant. Snuffles may and probably do exist. Hemorrhages from the umbilicus, nose, bronchial tubes and bowels are not unusual and are significant. The liver is enlarged, also the spleen, and the urine albuminous.

The symptoms of congenital syphilis usually appear from the second to the fifth week after birth. In cases not well marked in the beginning, the great restlessness of the infant may be one of the first things noted. Kelmer says when a breast-fed infant cries a good deal, is poorly nourished and is extremely restless, look for hereditary syphilis. Snuffles may exist from birth, and usually appear sooner or later. They may be confounded with adenoids

or a simple coryza, but their persistence points to specific origin. Chronic hoarseness is another suspicious symptom, which with the enlarged liver and spleen are, in addition to the eruption, the symptoms commonly showing themselves in the first weeks of life. The eruption is usually a dull, coppery red, and may be general or otherwise. Absence of itching, unlike eczema, is one of its distinguishing peculiarities. When the eruption appears on the nates it may be mistaken for the ordinary rash which is frequently seen in cases of neglect or poor digestion. The course of the eruption usually is about six weeks to two months and gradually becomes scaly at the end.

The prognosis in these cases is bad and it may be, all things considered, more a matter of congratulation than otherwise that such is the case. A syphilitic child is always handicapped by physical infirmities. The propagation of a tainted race cannot be a benefit to humanity in general. Treatment in many cases arrests the progress of the disease, but once syphilitic, the unfortunate individual is never safe and knows no peace of mind.

The pronounced and determined efforts which nature makes to put her stamp of disapproval on the syphilitic fetus at the start and her success may be interpreted as the beneficent operation of that law which elects none for survival but the fittest.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

(Continued from August.)

DR. J. P. CROZER GRIFFITH AND DR. R. L. LAVENSON, of Philadelphia, presented a communication on

CONGENITAL OBLITERATION OF THE ESOPHAGUS, WITH THE REPORT OF A CASE.

They claimed that malformations of the esophagus were very rare, even more rare than they were supposed to be. The first case was reported in 1607. Mackenzie reported sixty-three cases that he had collected of various forms of malformations. Hoppe, in 1905, had reviewed this subject quite fully. Malformations of the esophagus might be divided as follows:

1. Complete absence of esophagus. This, of course, was a very rare condition, only seven cases having so far been reported.
2. Partial or complete doubling of the esophagus. This was even more rare, only two cases having so far been reported. They had to add one more to this number.

3. Direct esophageal fistula without other lesion of the esophagus. Seven or eight such cases had been reported.

4. Stenosis. This might be due to several causes, such as (a) a mucous fold or (b) malformation of the tube. In such a condition the patient might live for many years. Some cases had been reported in patients over seventy years of age.

5. Congenital dilatation. This was usually accompanied with dilatation of the end of the stomach.

6. Obliteration of the esophagus, but without any fistula. A case of this kind was described in 1670, and about eleven have been described. In the *Archives of Pediatrics* two cases were reported by Phillips. When one spoke of obliteration of the esophagus, there seemed to be a difference of opinion as to what this meant. In some cases there was a patulous opening at each end of the esophagus, with a cord-like structure joining the extremities. Cases had been described, however, in which no cord-like structure was found, and it was only through microscopical examination that one was able to tell whether any traces were left. Probably no cases of complete absence of this portion of the esophagus had ever been reported.

7. Partial obliteration of the esophagus with a tracheoesophageal fistula. In Mackenzie's record of sixty-three cases of congenital malformation of the esophagus, forty-three were of this nature. Hoppe had tabulated fifty-nine such cases.

They had collected eleven or twelve such cases from the literature.

Fistula in the trachea was always near the upper extremity, as well as the lower fragment. The upper fragment was usually dilated, while the lower extremity was of normal size, but tapered gradually as the fistula ran upward. Nearly all the cases opened into the trachea. There were three cases on record where the fistula entered a bronchus.

A case of obstruction with fistula into the trachea was reported. This child was nine days old and was admitted to the hospital of the University of Pennsylvania. There was nothing of importance in the family history. The child had been unable to swallow since its birth. Any attempt to give anything was accompanied by attacks of cyanosis and regurgitations of mucus from both the mouth and nose. This appeared to be the typical history in these cases. The baby died a few hours after admission to the hospital, and at autopsy, the usual conditions were found. The fistula, however, was quite small.

The pathology of this condition was obscure.

DR. SAMUEL S. ADAMS, of Washington, D. C., reported a case of

SPASMODIC STRICTURE OF THE ESOPHAGUS IN AN INFANT.

The infant came under his observation at the age of four months. It was well nourished. It had been nursed by its mother to the age of three months, when there was substituted for the mother's milk a modification of cow's milk. Dr. Adams

requested the mother to give the child some water; four ounces of water were given; after the taking of the last ounce there occurred a series of attempts at vomiting; after the eighth or ninth attempt the water was rejected with a quantity of mucus. Dr. Adams diagnosed the condition as one of obstruction of the esophagus. He learned that the child had swallowed all right up to the age of three months; after this time, attempts at swallowing became futile and the baby was taken to the hospital. A surgeon there tried to pass a lavage tube, but failed. He finally got through a small sound and followed it up with an ordinary feeding-tube and was able to give four ounces of modified milk. The child remained in the hospital for some time and gained in weight; then the parents took the child away. During the following fourteen months Dr. Adams did not see the child, although he learned that the attacks continued. These attacks occurred every three or four days and lasted from six to twenty-four hours.

Within the past three weeks the child became very ill and was taken to the hospital where the physician passed bougies. A false passage was made. The child developed a pneumonia and died. On autopsy, signs of a posterior pneumonia were found. There was also a rupture of a diverticulum. There was an obstruction in the esophagus caused by a broken-down tuberculous gland. Above that was a diverticulum with an opening. The pathologist was not fully decided whether the rupture was caused by the surgeon or was necrotic, although he was under the latter impression. Below this obstruction were two diverticula, both with very friable walls.

DISCUSSION.

DR. AUGUSTUS CAILLE, of New York, had under his observation at present a boy of ten years, the son of a physician, who had had spasmodic stricture for five years. Examination had revealed the fact that there was no diverticulum. The inability to swallow was such that the boy was moribund from starvation. The usual caliber tube was used and he was fed in that way. He still had to use the tube once or twice a week. This lad had had hydrocephalus in his infancy and he thought the irritation was of central origin and very much doubted if the boy would ever get over it. Regarding the examination of the esophagus by means of a sound or of the esophagoscope, he wished to sound a warning. A girl of sixteen, who had some difficulty in swallowing, was examined with the esophagoscope by an expert specialist. He ran the instrument into the pleural cavity, in consequence of which a pneumothorax developed and the girl died within two days.

DR. C. B. PUTNAM, of Boston, reported a case similar to that reported by Dr. Griffiths. The child was three years old and had a history of not being able to swallow. Death ensued in the course of a few days. A condition very similar to that described

by the reader of the paper was found. The esophagus had a blind ending, the lower portion opening into the trachea.

DR. THOMAS MORGAN ROTCH, of Boston, said that this opened up a differential point in diagnosis, since we had of late much added information in regard to pyloric stenosis. Stricture of the esophagus and pyloric stenosis were almost identical, as far as the rational signs were concerned. The patients would keep their food down sometimes for a day or forty-eight hours and then vomit. There was danger in passing a sound, because there seemed to be a thinning of the wall in the lower part of the esophagus in this affection. A careful autopsy made in one case where there was congenital stenosis at the entrance of the stomach and above that a ballooning of the esophagus from stretching showed a very thin place in the lower part about 1 cm. in diameter which was about to rupture into the trachea. The least mechanical interference before death would have ruptured it. In a certain number of these cases nothing could be found by physical examination, although the Roentgen ray aided much. At autopsy, the area where the membrane was so thin was ruptured, even with the most careful manipulation. This was an important class of patients. They were so much like cases of chronic indigestion that the greatest care had to be used before resorting to any other method to determine whether or not they were cases of chronic indigestion.

DR. A. JACOBI, of New York, asked what was the exact site of the constriction in Dr. Griffiths' case.

DR. GRIFFITH replied that it was just above the bifurcation.

DR. JACOBI said that was the position that gave rise to a great deal of difficulty in the adult. Carcinoma was apt to be located at that place. He thought the cause must be sought in embryonal conditions. The parts were formed separately and, as a rule, would find one another, but in this neighborhood there was always a narrowest part as we found when we attempted to introduce a large sound into the esophagus of a healthy person. This constriction must be explained by the nature of its embryonal development. These constrictions were found much more frequently in the rectum, and when you meant to open up such a rectum for operation you might find these parts improperly developed, so that the trochar ran into the peritoneal cavity. As to the diverticuli, they might occur because the muscular layers of the intestinal tract were not uniformly developed. It was quite common to find defects of these layers. We must explain diverticuli formed below the constriction in this way. The muscular layers in these places were incompletely developed. Certain places imperfectly developed were found throughout the intestinal tract, and the upper part of the apparatus was no exception.

DR. SAMUEL S. ADAMS, of Washington, stated that there was no fluid found in the tissue surrounding the esophagus nor in the bronchial tubes, yet he thought that pneumonia probably re-

sulted from inhalation of some of the food that the child had been trying to swallow.

DR. ALFRED HAND, JR., of Philadelphia, presented the record of a case showing

DEFECT OF THE VENTRICULAR SEPTUM AND ABSENCE OF THE
PULMONARY ARTERY.

The patient was a boy about three years of age, who was admitted to the hospital July 10, with the statement that he had severe attacks of dyspnea. The father and mother, as well as two other children, were in good health. The personal history was negative; the child had never had the diseases of childhood. He learned, however, that the child was born a "blue baby." The first anginal attack occurred in April, 1907. Up to some time in July, the patient had one attack daily; then he had two attacks a day. Nothing in the way of an aura was noticed. The patient seemed to have some pain with each attack; the mother claimed that convulsions occurred; but the history did not point to convulsions. The patient cried when the attacks came on, but never bit the tongue. After each attack he went to sleep. During the attacks the respirations were rapid and noisy, the breathing being almost stertorous in type. The heart's action was rapid, but the sounds were obscured by the noisy lung sounds. The pupils were semidilated. These attacks lasted about one hour. The boy appeared to be fairly well developed; the head had a good shape, and the anterior fontanel was about the size of a five-cent piece. The child walked normally. The abdomen was not sunken. The liver reached 2 cm. below the ribs. The spleen was not palpable. There was no ankle clonus, no Babinski's and no König's sign. On July 11, the dyspnea lasted nearly two hours; there was marked cyanosis, and the patient was much relaxed. The pulse became weak and rapid. There were no clonic or tonic movements. There was a brassy cough. There was a marked dullness over the upper part of the sternum. He thought of the possibility of an enlarged thymus. One thousand units of antitoxin were administered without any apparent effect. From noon to 3.45, the patient had a similar attack. At 5 A. M., there seemed to have been a recession of the dyspnea and cyanosis. The heart sounds were superficial and close to the ear, and he thought of the possibility of an enlarged bronchial gland. Babinski's sign now became positive. Next day, at 12 o'clock, another attack occurred. The breathing was labored, with groaning, as if the patient was in great pain. It looked like an attack of angina pectoris, such as occurred in old people. One-twelfth of a grain of morphin was given, which caused the patient to rest and sleep. Any subsequent attack was aborted by morphin. The temperature ranged between 98.8 and 107.4 when death occurred. At autopsy, there was found an enlarged thymus gland. The heart was carefully examined and found to weigh 115 grams; it was 9.5 x 7.5 x 3 cm. The pulmonary

artery was absent. There was a defect in the membranous portion of the septum. There was no opening from the right ventricle, except an opening into the left ventricle. The ductus arteriosus was not to be found in the septum. There were numerous infarcts in the spleen and in the liver and kidneys. There was a complete obliteration of the pulmonary arteries—a condition which was very rare. The absence of the heart murmurs could be explained by this total absence of the pulmonary artery. The distress complained of must have been due to the fact that there was more blood than normal in the lungs and less in the general circulation.

DISCUSSION.

DR. A. JACOBI, of New York, said that the nutrition of the lungs was by bronchial arteries coming from the aorta. They took the place of the pulmonary artery, which was absent or stenosed. In such cases life might be prolonged. He had published a case some ten years ago where the patient lived to be twenty-nine years of age and then died of very copious pulmonary hemorrhage. He did not think these cases were rare or were possible of diagnosis. There was a late systolic murmur that extended over all the heart. The two ventricles were alike in that they remained just as they were at birth.

DR. W. REYNOLDS WILSON, of Philadelphia, presented a

SIMPLE METHOD OF CIRCUMCISION IN THE NEW-BORN.

He had been dissatisfied with the older methods and for certain good reasons: (1) The incompleteness of the removal of the foreskin in those instances where the latter was adherent to the glans. (2) In the application of the sutures. These sutures were placed irregularly and might have to be tightened to the point of unduly constricting the tissues. As a result edema occurred and the sutures began to cut. (3) The length of time required for the operation.

The adhesion of the mucous membrane lining the glans was carefully broken by sweeping the point of the unopened scissors beneath the foreskin. This permitted the introduction of the scissors beneath the prepuce. The skin and mucous membrane were divided to the base of the glans. The mucous membrane was rolled back to the corona and rendered perfectly free. The scissors were then used to trim off the redundant fold of the skin and mucous membrane on either side of the incision. This was done carefully while the field of operation was kept free from blood. The roll of skin to the distal site of the frenum was likewise removed, in order to avoid the edematous flap which was so often left at this point when enough tissue was not removed. A tape of gauze, one-half an inch in width, cut so that the edges are frayed, was now applied, securing a roll of mucous membrane in position behind the corona, compressing the blood-vessels. This tape was about ten inches in length and was required in

order to admit of several unwindings. The end of the glans should be left uncovered in order that there might be no obstruction to the meatus.

DR. S. C. COTTON, of Chicago, believed he had not circumcised a baby in eight or nine years. Formerly it had been a fad to circumsize all male babies. He had seen a Jewish rabbi perform the rite of circumcision twenty-five years ago. He did more circumcisions than any other rabbi in Chicago and had uniformly good results. He seized the prepuce with the thumb and finger and placed over it a little shield made from a silver half-dollar, with a slit extending two thirds the way through it. A downward sweep with the scalpel was made along this shield, amputating the prepuce. Then laying the shield aside and taking the two sides of the cut surface between his fingers and thumbs he retracted the mucous lining with the ring fingers; in the meantime he held the integument tightly. Alum water was applied and a little tape was wrapped around to hold the reduplicated tissue in place. This was also wet with alum water and a piece of gauze applied, which had a hole in the middle, which held the dressing in place. There were no sutures, and the cases all did well. He had used the method, but did not recommend it as he had formerly done.

DR. W. REYNOLDS WILSON said, in closing the discussion, that the operation might be done with the greatest simplicity by using a pair of surgeon's scissors. He had had an accident which led him to adopt the scissors. A nurse whom he thought could be depended upon did not hold the child's legs, and he brought them up forcibly causing him to sever the femoral artery. Fortunately, the circumcision had been completed. He enlarged the femoral opening, introduced forceps and caught the proximal end of the vessel.

DR. J. PARK WEST, of Bellaire, Ohio, reported a case of

PYELITIS TERMINATING IN SUPPURATIVE NEPHRITIS.

A female child, ten months of age, was taken ill. Her illness was divided into three periods. The first was represented by a lobar pneumonia. The second by a pyelitis. The third by a pyelonephritis.

A positive diagnosis of lobar pneumonia was not made until two days before the crisis, which took place early on the morning of the sixth day of her illness. The second period of ten days began on the evening of the crisis, with a temperature going up to 103, without symptoms on the part of other organs. It was believed that a pyelitis began as the result of the pneumonia. There was no indication, nor had there been of a vulvovaginitis. It was only during the last period that it developed. On the first day of the second period, a highly acid urine containing a number of small epithelial cells was obtained. On the next day, the color of the urine was that of milk and water; for the next eight days, the urine was of clear milk color. The specific

gravity of three specimens obtained was 1014, 1012 and 1014. It always contained pus, albumin, an abundance of epithelial cells of different kinds and blood-cells. On the second day of this period, the temperature was 104.4, after which it went down gradually. For three days, there was a marked soreness over the body and at times over the left kidney. On the third day, swelling of the face, hands and feet appeared. On the sixteenth day of the sickness of the third period, there appeared suddenly severe gastrointestinal and uremic symptoms, which continued until her death, eight days later. Vomiting was very severe and the stools numbered from four to twelve. Soon after overcoming these symptoms a vulvovaginitis appeared. The urine remained milk-like in color, but did not look so clean.

The postmortem showed the pelvis of the kidney to be thin and rough; on the surface were very small spots of distended capillaries. The left kidney weighed eighty grams; the right seventy-two grams. Dr. W. H. MacCallum made the microscopical examination. This was a remarkable case of suppurative nephritis. There were clumps of bacteria scattered throughout the tissues, but none in the blood-vessels. There were bacilli larger even than the typhoid bacillus. The tubules were very generally distended with great quantities of leukocytes and desquamated cells. There were no distinct abscesses, but relatively few of the tubes escaped. The glomeruli were fairly well preserved. The remaining tubules showed a most extreme fatty degeneration of the epithelium. The tubules of the medulla were fairly well filled with debris of cells and leukocytes. The absence of the glomeruli changes and the presence of the bacteria in the tubules and not in the blood-vessels seemed to argue in favor of an ascending rather than a hematogenous infection.

DR. ISAAC S. ABT, of Chicago, thought it was best to cystoscope the bladder and to find out something in regard to the bladder wall and the orifices of the ureters, especially in female children. The cystoscope often threw light on these cases, especially as to indications for operation.

DR. A. JACOBI, of New York, asked if gonococci were found.

DR. WEST replied that no examination had been made for them, as there was no history of former vulvovaginitis.

DR. JACOBI said that undoubtedly pyelitis and vulvovaginitis went together. He then asked if the uterus had been examined.

DR. WEST said that it had not.

DR. JACOBI said that it was common to find a vulvovaginitis after it had existed for weeks and months, and this was probably because the process at that time was frequently limited to the uterus. Up to seven or nine years of age, the uterus was not smooth, but the mucous membrane lay in folds so that the gonococci might easily hide there for weeks or months. This explained why, when we thought we had cured a case, it suddenly broke out again. A gonococcic metritis might exist for a long time before it made its appearance.

DR. CHARLES G. KERLEY, of New York, said this paper recalled to his mind a case that he was asked to make an autopsy. The child was said to have had malaria, but the autopsy showed extensive cystitis and multiple nephritic abscesses.

DR. HENRY KOPLIK, of New York, read a paper on an epidemic of

POLIOMYELITIS ANTERIOR ACUTA.

The epidemic of this disease which engaged the attention of the profession of New York City and vicinity last summer was very extensive. According to the report of the State Board of Health, there were over 1200 cases in New York City alone, and the impression prevailed that many cases had not been reported. The conditions of the atmosphere, of the weather, etc., were not unusual, and the disease had the characteristic of an ordinary epidemic. It was widely distributed, particularly in the city limits, with a few cases appearing in the suburbs. The disease invaded the fashionable quarters as well as the poorer places. The condition of the streets was not unusual; they were as clean as could be expected in a densely populated portion of the city. The milk and water supply was as good as during previous summers. So far as external hygienic influences were concerned, they were neither better nor worse than in previous years. The local conditions were matters of speculation. The epidemic in its behavior resembled closely the one seen by Horwitz in Sweden. It affected children of all ages; there were a few cases among adults. The characteristics of the disease could not be considered as clearly defined by poliomyelitis anterior. This disease was one that was hitherto unknown to many investigators. Many cases resembled meningitis in certain particulars. Dr. Koplik described certain classes of cases:

CLASS I.—Cerebral cases. A child, in apparent health, would go into a condition of unconsciousness or go to bed well to awake with headache and vomiting. Or the child would develop paralysis of all extremities. The paralysis would be followed by an increase in the sopor and symptoms referred to the bulb or medulla. There would be difficulty in respiration, and in swallowing, with increasing coma and paralysis, ending in the death of the patient from respiratory failure and paralysis. In some cases there would be paralysis of the abdominal muscles, the muscles of the back, and those of all four extremities. They showed definite signs of bulbar paralysis with diaphragmatic breathing.

CLASS II.—Neurotic cases. The child would go to bed, to awaken later with an acute pain in the extremities referred in many cases to the joints. These patients might cry in the night. Gradually paralysis of one or more extremities would develop and with a clear sensorium. There might occur a mild febrile rise which would gradually subside, the temperature dropping to the normal. These cases were often mistaken for rheumatism. After lasting three or four weeks, the pain would subside and

leave a paralysis of either or both extremities or one upper and one lower; at times nothing but a facial paralysis would be left to show that the patient had been completely paralyzed. The cases that recovered appeared to be merely cases of neuritis.

CLASS. III.—In this set of cases, corresponding to cases of acute poliomyelitis anterior, the patient would go to bed perfectly well and awaken with paralysis of one or two extremities or a paralysis of a little group of muscles in the forearm, leg, thigh or face. Many of these cases of poliomyelitis anterior began with slight disturbances of the stomach, with febrile attacks and sudden paralysis.

They had, therefore, three distinct classes of cases—the cerebral, the neurotic and the classical cases of anterior poliomyelitis.

It was hard to say whether the pathology in all these cases was the same; it was sufficient, however, to state that all the victims suffered from the same infectious agent. The cerebral cases were autopsied and the pathological appearances, gross and microscopical, were identical with the fatal cases described by Harvey. Nothing was found in many cases but a polyneuronal cytolysis (see Harvey, in *Journal of the American Medical Association*). The term poliomyelitis must be accepted only as a temporary nomenclature. The cerebral form of cases, with paralysis, was peculiar. If the patients were not unconscious, the sensorium was clear; yet the patients would not be able to lift an extremity or help themselves. They would lie as in a trance and with a normal temperature.

The neurotic cases were peculiar in not only having pains in the extremities and joints, especially at nights, but because of the hyperesthesia. They were perfectly helpless. They could not even sit up and had to be carried about. Their recovery was complete, and the conclusion was reached that there was no affection of the cord, but an affection of the nerve-trunks.

What was especially astonishing in the present epidemic was the rapid atrophy of the muscles in those cases in which the paralysis remained permanent. Six weeks after the onset of the disease there occurred the reaction of degeneration. Contractures rapidly followed atrophy of the muscles. The lower extremities in particular showed this rapid atrophy.

With regard to recovery, some cases made a complete recovery from the paralysis. Some cases, even though completely paralyzed, could walk, but the upper extremities remained paralyzed. Some made recoveries with contractures.

At the hospital for deformities there occurred a series of cases in which the only evidence of the disease was a facial paralysis and facial atrophy.

At the Hospital for Ruptured and Crippled, of sixty persons seen by Dr. Gibney, there were some history of either a diarrhea or constipation.

There was another set of cases in which there was a tonsillar infection before the onset of the disease. Dr. Koplik thought

that the nomenclature of this disease must be revised. Here was a new infectious agent capable of causing paralytic disturbances and even death. One hundred and fifty odd cases came for constant treatment because they were infected during this epidemic.

With regard to the treatment, hot baths with massage of the extremities was of value. The use of electricity seemed in some cases to aggregate the symptoms, especially when there was pain along the nerve-trunks. In cases of complete paralysis he found intramuscular injections of strychnin valuable. Cupping along the spine had been tried. He could not say what particular method of treatment did good. The principle aimed at was to keep up the tone of the muscles that were paralyzed and to wait for the recovery of the patient.

DR. L. E. LAFETRA, of New York, read a paper on the

EARLY SYMPTOMS OF THE RECENT EPIDEMIC OF POLIOMYELITIS.

The recent epidemic in New York City furnished an opportunity of observing many cases in which the symptoms presented were not those that occurred in the ordinary conception of the disease. Of 63 cases 20 were under treatment at the Babies' Hospital, 13 or more were seen by Dr. Kerley, 30 were seen at the children's department of the Vanderbilt Clinic. Vomiting occurred in 25 cases; constipation was present in 14 cases; diarrhea occurred in 17 cases; cough, tonsillitis and sore throat occurred in 6 cases; fever occurred in 52 cases, but was probably present in all; the fever lasted from two to three days generally; restlessness and irritability were common in this epidemic, occurring 37 cases; delirium was present in only 2 cases; convulsions occurred in but 4 cases; rigidity of the neck appeared in 11 cases, and was exceedingly painful. Babinski's sign was present in 3 cases at the Babies' Hospital; atrophy was present in 10 cases; stupor was present in 4 cases; headache was noted in but 10 cases; photophobia was present in 3 cases. Pain and tenderness in the affected limb were present in 32 cases.

With regard to the character of the paralysis, it was flaccid in 58 cases, spastic in 5. The paralysis came on early. The muscles of the neck were involved in 1 case. Opisthotonos occurred in 1 case for five days, and in another for ten days. There was a general anesthesia in 1 case. There was an unilateral paralysis of the abdominal obliques in 2 cases. Lumbar puncture was done in 14 cases, from 15 to 70 c.c. of fluid being removed; the fluid was clear in every instance. In only 2 cases were any cells found and a few mononuclears. The blood-examinations were not made often enough to give anything of value.

The diagnosis of this disease in the beginning of an epidemic was exceedingly difficult, and confusion was to be had especially when the acute meningitis was attended with pronounced irritative symptoms.

Careful studies made in Norway and Sweden had thrown much

light upon this disease, and showed how closely related were disease of the nerves.

The following classification was offered: (1) Ordinary paralysis. (2) Progressive paralysis (Landry's). (3) Bulbar paralysis. (4) Acute encephalitis. (5) Ataxic form. (6) Polineuritic. (7) Meningeal form. (8) Abortive form. Wickman proposed the name Heine Medin disease, and he would classify as above.

DISCUSSION.

DR. L. EMMETT HOLT, of New York, said that the recent epidemic of poliomyelitis was being studied by a committee appointed by several of the societies, and according to the best information that the secretary was able to get there were about 3000 cases. If these figures were correct, this had been the largest epidemic in the United States and probably in the world. He did not think the disease was limited to New York City, though it occurred in larger numbers in the city districts. He had been impressed by the groups of cases occurring together. Two children of a physician came down with symptoms of the disease ten days after their return to the city. Both had recovered completely. A child was admitted at the Babies' Hospital and seven days later a second child who had been sleeping in the same bed with this one was taken ill. He cited a number of similar instances and they were so numerous as to make it seem probable that the disease was mildly contagious. One striking thing was the number of cases that recovered completely. He was also surprised at the number of cases that died, as poliomyelitis was looked upon as not endangering life. The total mortality was something like 12 per cent. When the disease occurred in sporadic form, it was probably not recognized. The epidemic stopped with the advent of the month of October, and this had been the history of the disease everywhere. The history of other epidemics showed that the disease recurred the next year. They had sent the fluids from punctures to the Rockefeller Institute to Dr. Flexner and the results had been negative from every point of view. Dr. Flexner thought that the findings pointed to an acute microbic infection of the spinal cord and the results suggested a toxic degeneration of the cord due to toxins produced elsewhere in the body. He had seen obstinate constipation in several cases. Recently he had seen two cases of polioencephalitis that ran a course very like the usual picture of poliomyelitis. A child came to the hospital with a history of convulsions followed by stupor. It soon became evident that the disease was not meningitis. The temperature would rise to 104 and then drop to normal. These cases recovered completely. In spite of the location of the disease and its similarity to spinal cases, it was suggested that we had a disease that was an acute inflammation of the central nervous system, which generally localized its effects upon the anterior horns, but might affect the cerebrum without affecting the cord.

DR. A. JACOBI, of New York, said eight different types of the disease had been observed. It was a disease of the whole nervous system, perhaps not of the cord itself. One common symptom was small hemorrhages. They had been found not only in the anterior columns of the cord, but in the posterior and in the brain itself. They produced symptoms according to their location. Small hemorrhages did not necessarily give rise to any symptoms whatever, so far as sensation, motion and intellect were concerned. In cases of concussion of the brain, there were numerous small hemorrhages, and these cases recovered without paralysis or disturbances of intellect. He thought that the disease in a large number of cases was more an encephalitis than a poliomyelitis. Where poliomyelitis was predominating there should be intact patella reflex. Where the cord was affected the reflexes disappeared and atrophy set in very soon. If we recalled what was known of poliomyelitis and then remembered that the epidemic of the winter was twenty times as extensive as the largest that had been observed and the cases a hundred times as numerous as occurred in many of the epidemics, we would hesitate a little in demanding the same symptoms that were formerly observed. As we did not know the etiology, we should be satisfied in saying that poliomyelitis was a disease striking the nervous system as a whole, but more in one place than in another. Cases of polioencephalitis had a greater tendency to recover than cases of poliomyelitis?

DR. ISAAC ABT, of Chicago, asked if there had been any autopsies on the fatal cases and what the findings were.

DR. JOHN LOVETT MORSE, of Boston, said that Dr. Jacobi had anticipated him in saying that there had been nothing new in the symptomatology of cases during the past epidemic. He had analyzed cases of infantile paralysis that he had seen over a considerable period. He had had two cases worth mentioning, one died from paralysis of the muscles of respiration, in the other there was paralysis of these muscles, but the child recovered. The summary of his cases, though covering a period of years, corresponded well with the cases in this epidemic.

DR. CHARLES G. KERLEY, of New York, had seen forty-three cases in the last epidemic. These cases began to occur late in August and early in September. They increased in number until October, when they practically ceased. He had seen more or less poliomyelitis for twenty years, and he agreed that in the recent epidemic they had had an entirely new proposition. Some of the cases it was impossible to differentiate from cerebrospinal meningitis. He found the northern boundary of the territory of the epidemic was at Malden. There were only twelve or fifteen children in the school there and four had poliomyelitis. That seemed to be the apex of a triangle that extended down the river until it embraced New York. He had had one case which was peculiarly interesting to him. The child came down with acute symptoms of fever and vomiting and developed facial

paralysis. This was the only evidence of paralysis and it still persisted.

DR. KOPLIK closed the discussion. In regard to postmortem findings there were autopsies on two fatal cases at Mount Sinai Hospital, of which the findings would be published later. In a general way they corresponded to what had been described here. There were areas of softening throughout the cortex, areas of hemorrhage throughout the cord and areas of softening in the cord. The softening began in the meninges and extended from there. No other disease that was in progress at the same time was affected by the presence of poliomyelitis. He related the case of a child who had come to him in March with symptoms pointing to some general nervous trouble. The child was tired, did not care to walk, and when it sat down it did not care to get up again. The child developed poliomyelitis. The right upper extremity was paralyzed and the muscle atrophied. The two nervous diseases existed side by side and the nervous affection that was perhaps more serious than the poliomyelitis was not affected by it.

DR. C. W. DUCKINGHAM, of Boston, reported a case of

APPARENT TUBERCULAR MENINGITIS IN WHICH THE AFTER-HISTORY MADE IT PROBABLE THAT THE DIAGNOSIS WAS A MISTAKEN ONE.

A boy, seventeen months old, had malaise for from one to two weeks, with cephalic cries. On April 10, Dr. J. W. Redmond was called because of some shuffling in walking, confined to one foot. There was no tenderness. In the next four days there were some vomiting and convulsions. There was no history of tuberculosis nor of syphilis. Dr. Redmond asked Dr. Duckingham to see the patient on the 14th. The difficulty in walking had then almost entirely disappeared. There was strabismus, pupils dilated and sluggish, the right being more dilated than the left. The knee-jerks were unequal, the right being the more marked. The Kernig sign was marked. Babinski's sign was present, but slight. The head was not retracted. Examination of the eyes and ears proved negative. A provisional diagnosis of tuberculous meningitis was made. A lumbar puncture was done, the fluid running at first under considerable pressure, and perhaps from 10 to 12 c.c. were withdrawn. Because of a slight contamination in the blood in the first c.c., the first portion was thrown away, and the last saved in a clean test-tube.

The pathological report by Dr. Leary was as follows: The specimen received from Dr. Redmond consisted of $3\frac{1}{2}$ c.c. of clear, colorless, watery fluid. This was shaken down in a centrifuge without obtaining any visible sediment. The lower portions of the fluid were smeared on slides and stained by Wright's method. A careful search resulted in the finding of eighty-nine cells, all but three of which were lymphoid cells. The diagnosis made was chronic inflammatory, probably tuberculous meningitis.

The pressure-symptoms were very quickly relieved, and in

about a week the child had recovered its health. He remained well until May 20, when Dr. Redmond last saw him. This after-history was compatible with its being one of the comparatively few cases of cerebrospinal meningitis in which there were prodromal symptoms and in which the cerebrospinal fluid contained an excess of mononuclear cells.

DR. JOHN LOVETT MORSE, Boston, reported

AN UNUSUAL TYPE OF ACUTE NEPHRITIS IN CHILDREN.

He had recently seen a number of cases of acute nephritis in children in which the characteristics of the urine had been materially different from those of the ordinary form, the chief difference being the complete, or almost complete, absence of blood and blood elements and the presence of a large number of small round mononuclear cells, often associated with a considerable number of polymorphonuclear leukocytes. There can be no doubt that these cases are acute and not chronic. The course was the same as in other forms of acute nephritis with the exception that the duration was usually shorter and the prognosis somewhat better. Histories were cited to illustrate this type.

In a number of cases there had been a moderate amount of blood in the beginning which disappeared after a few days, the urine then taking on the characteristics referred to. In some cases not only was blood absent, but very few other renal elements were found, even when the symptoms were marked and there was a large amount of albumin. They did not differ in their symptomatology and course from the other forms of acute nephritis; it might be that on the average the cases were milder and the duration shorter. They might eventuate in death or be accompanied by convulsions or possibly develop into a chronic type. He was entirely ignorant of the pathology of this condition, never having had a case autopsied. It seemed probable that the pathological changes in these cases were somewhat different from those in the cases described by Heubner. Judging from the absence of blood, there was, in all probability, little or no change in the glomeruli; and judging from the number of cells and the large diameter of the casts, the pelvis of the kidney and the lower tubes were more involved than those higher up. In all probability, the condition was one of pyelonephritis rather than the ordinary acute glomerular or interstitial nephritis.

DR. HENRY KOPLIK, of New York, was reminded of Osler's description of such kidney trouble in cases of typhoid, in which there were leukocytes and casts in the urine. He had at present a case in which nephritis probably was the result of gastroenteritis. In these cases of nephritis following gastroenteritis in young female children there was a question of involvement of ureters and bladder.

DR. H. J. MASON KNOX, of Baltimore, intended to report a case which coincided very closely with the description of Dr. Morse's cases. There was hematuria, a number of leukocytes, a small

amount of nuclear cells and a number of casts. The case ran a chronic course and came to autopsy. The kidneys showed the convoluted tubules undergoing hyaline degeneration. The nuclei did not stain at all. This belonged to a group of cases in which the degenerative changes were the most marked feature.

DR. L. E. LAFETRA, of New York, had a case which corresponded quite closely with the first case reported by Dr. Morse. In this case the leukocytes persisted for a long time after the disappearance of the casts. He was unable to find anything to account for the origin of the condition. The child was in good health otherwise and the only thing that called the mother's attention to the trouble was some puffiness of the eyelids.

DR. ISAAC A. ABT, Chicago, offered a statistical summary of answers he had received to

AN INQUIRY INTO THE STATUS OF THE KINDERGARTEN.

1. Of 119 replies from physicians, sixty-six, or 55.46 per cent., were, for reasons medical or otherwise, in favor of the kindergarten; twenty-five, or 21.00 per cent. were unfavorable; and twenty-eight, or 23.50 per cent. were indifferent. Unfavorable answers were given chiefly on medical grounds.

2. Of seventy replies from mothers, there were forty-three, or 61.47 per cent., favorable; eleven were unfavorable, or 15.71 per cent. Sixteen, or 22.85 per cent., were indifferent. Those who favored the kindergarten assigned good results to the social, the moral and esthetic effects, while those of a diverse opinion were chiefly based on insufficient physical care and the danger of contagion.

3. Of forty-three replies from superintendents and principals, thirty-two, or 74.41 per cent., were favorable; five, or 11.64 per cent., were unfavorable; while six, or 13.95 per cent., were indifferent.

4. Of twenty-six replies from kindergartens, twenty-five, or 95.15 per cent., were favorable, while one, or 3.84 per cent., was indifferent.

5. Of twenty-one replies received from primary teachers, fourteen, or 66.66 per cent., were favorable; three, or 13.33 per cent., were unfavorable; and four, or 19.03 per cent., were indifferent.

6. From the stand-point of physicians, forty-two were favorable and fifteen were unfavorable. Of the replies coming from the East, seventeen were favorable and six unfavorable; from the middle West, three were favorable; from the West, two were favorable; from the North, one was favorable and one not.

7. As to the hygienic conditions of the kindergartens, twelve kindergartens wrote of the proper and improper conditions that existed.

8. The average age of pupils of the kindergartens was five years.

9. The percentage of physicians who favored the kindergarten, both for the rich and the poor, was 47.90.

10. To the too early entrance to the kindergarten accompanied by harmful effects, forty-eight physicians, or 40.33 per cent. of the total, had subscribed their testimony.

11. 46.33 per cent. of physicians believed that there was no greater susceptibility, and no increase in liability of contagious diseases and pulmonary affections.

Dr. Abt said that it was in the hope of throwing some light on the medical aspect of the kindergarten that he had made these investigations and made his report. This investigation was begun without prejudice either for or against the system, and was purely in a spirit of inquiry, and with the view of obtaining information on some of the vital questions that the physicians were called upon to decide in their daily talk with their patients. The results obtained he considered to be quite disappointing.

ELECTION OF OFFICERS.

President, DR. PUTNAM, of Boston; *First Vice-President*, DR. ISAAC A. ABT, of Chicago; *Second Vice-President*, DR. THOMAS S. SOUTHWORTH, of New York; *Secretary*, DR. SAMUEL A. ADAMS, of Washington, D. C.; *Treasurer*, DR. J. PARK WEST, of Bellaire, Ohio; *Member of Council*, DR. ALFRED HAND, JR., of Philadelphia; *Recorder and Editor*, DR. L. E. LAFETRA, of New York. Next place of Meeting, LENOX, Mass.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Rhabdomyosarcoma of the Prostate.—D. M. Grieg (*Brit. Jour. Child. Dis.*, May, 1908) records the removal from a child of four years, by suprapubic cystotomy, of a large irregular, fungating tumor of the prostate the size of a Tangerine orange, projecting into the bladder around the internal urethral meatus. It had caused painful micturition, then retention and dribbling. Microscopic examination revealed a sarcoma containing embryonal striated muscle cells, a rhabdomyosarcoma. Three other such cases have been reported.

Congenital Hypertrophic Pyloric Stenosis.—Edmund Cautley (*Brit. Jour. Child. Dis.*, May, 1908) holds that there is grave danger of ascribing to pyloric hyperplasia the symptoms due to spasm, with or without dilatation of the stomach; that there are mild degrees of hyperplasia compatible with life and giving rise to no serious symptoms; that some of these mild cases depend for their fatal issue on secondary complications which are curable by diet and lavage; that the majority of the cases tend to gradual contraction of the circular muscle and a degree of obstruction which is incompatible with life and only curable by surgical methods. He protests strongly against delay in adopting surgical measures, as he is convinced that the bulk of the supposed

cures of this affection by medical means are really instances of simple pyloric spasm. Great care is essential in distinguishing between spasm and hypertrophy, otherwise many unnecessary operations will be performed.

Association of Scarlatina and Measles in the Child.—P. Lereboullet (*Le Prog. Med.*, June 13, 1908) says that the association of measles and scarlatina is important because of the gravity of the prognosis in the child. The author finds that this association occurs especially in hospitals and at school. Since the incubation period of scarlatina is short, that disease appears first in cases in which both have been contracted at the same time. Here the prognosis is very grave. The author considers scarlatina secondary to measles, scarlatina and measles simultaneously, and scarlatina occurring a little before measles. When scarlatina is secondary to measles the evolution of each disease is little modified. The bronchial complications of measles may be rendered much worse and death ensue. When scarlatina and measles evolve together, the mixed eruption may present special characteristics rendering diagnosis difficult. Otitis or bronchopneumonia may occur, but in general there is little modification of the symptoms of the two diseases. When scarlatina precedes measles with a certain interval, the evolution of measles is sensibly modified. A fatal bronchopneumonia may result with dyspnea and high fever. When scarlatina precedes measles at a considerable interval, the prognosis is not so grave. Treatment to disinfect the throat relieves the symptoms before the appearance of the measles eruption. The gravest form of all is that in which the appearance of the measles is immediately preceded by the scarlatina eruption. A virulent culture of the streptococcus exists in the throat and is complicated by the presence of the other infection. A disseminated bronchitis is generally the result. If scarlatina follows measles when the bronchial symptoms have passed, the effect is not so bad. The practical conclusions are that immediate isolation of the patient from all other cases is important and disinfection of the throat should be thoroughly carried out in every doubtful case.

Melena Neonatorum.—Samuel W. Lambert (*Med. Rec.*, May 30, 1908) reports a case of this condition which seems to cast important light upon the etiology of the affection. The essential symptoms were early nosebleed, rapidly increasing pallor and anemia, febrile action and restlessness, followed by characteristic bloody vomit and stools and very extensive subcutaneous ecchymoses, catharsis, calcium lactate and adrenalin were employed ineffectually. On the fifth day the case seemed hopeless. The baby's skin was waxen white and the mucous membranes without color; the nasal bleeding was continuous; the vomited matter contained food curds, dark blood, and at times bright clots; the stools were frequent and contained bright red blood; the subcutaneous hematoma on the scalp increased and ecchymotic spots appeared on the legs; the respiration was rapid and

superficial; the pulse 150 and weak. The right popliteal vein of the body was sutured to the left radial artery of the child's father, without anesthetic to either patient, and enough blood allowed to flow into the baby to change her skin from a pale transparent whiteness to a brilliant red color. She began to cry lustily and to struggle. The wound in the leg up to this time had oozed a slight amount of pale watery blood, which did not clot well. It began to bleed freely and the blood promptly clotted. The nosebleed stopped instantly. The pulse became full and strong and slowed down, and the respirations were deep and full. As soon as the wound was sutured and dressed the baby was fed an ounce of milk, which she took ravenously and retained, and immediately went to sleep. Since the ending of the transfusion there has been no hemorrhage, no vomiting, and no diarrhea. Convalescence from the operation was uninterrupted except for a slight infection of the wound. There was no evidence of hemolytic action at any time and all the symptoms of melena ceased at once. The hematoma was absorbed rapidly, except for a slight discoloration of the upper lid of the right eye. The stools became of normal character two days after the operation. The wound healed, and at eight weeks the child appeared to be a normal child of its age. The latest accepted theories of melena neonatorum point not to ulceration or to gross lesions, but to the capillary blood-vessels as the seat of the bleeding, and the clinical picture of these cases is undoubtedly very like that of an infection as the etiological factor. But the course and the remarkable cure of the case reported would seem to disprove both the infectious theory of its origin and the blood-vessel explanation of the diapedesis of red cells and disturbed osmosis resulting in the capillary hemorrhages. The only possible explanation of so rapid a change must be found in a chemical condition of the blood. The final conclusion as to the nature of the disease is that melena neonatorum is a congenital malformation of the blood of unknown chemical nature. The solution of the problem of its etiology is to be found in a chemical study of the processes of osmosis in the capillary vessels, of the chemistry of blood coagulation, and along kindred lines.

Analgesics in Pediatric Practice.—Le Grand Kerr (*Arch. Ped.*, May, 1908) says of external analgesics that counterirritants must be placed directly over the organ or part when the condition causing the pain is deep-seated. When a superficial part is affected and that part is supplied by the anterior branches of a spinal nerve, the counterirritant must be placed over the posterior roots of the nerve. Mild counterirritation is useful in infants, but blisters must be used in older children, and not in them when the arterial tension is high or the vitality low. Galvanism will relieve the pain of neuralgia. And in those conditions in which there is a marked muscular spasm with pain (as in many cases of wry-neck), the relief afforded is immediate and marked. Galvanism seems to fail in neuralgia of the fifth nerve in which the

pain is intense at night. But in these cases the iodids afford marked relief. Application of heat gives much relief from pain in sprains, acute articular rheumatism, torticollis, pleurisy and colic. In earache and painful conditions in the throat, its use in the form of a douche or gargle affords much comfort. The pain from an adenitis, appendicitis, congestive headache, acute pharyngitis, tonsillitis, and many similar conditions is lessened or entirely relieved by the judicious application of cold. Injection into the skin itself has the distinct advantage that added to the local effect of the agent used there is the effect of pressure on the nerve endings. Acupuncture must be thought of in deep-seated neuralgias which yield to no other treatment. The injection of water directly about a superficial nerve will prove analgesic. Of the agents used for local relief of pain, cocain stands at the head. Others are ether, chloroform, alcohol, ethyl chlorid, menthol, phenol and dilute hydrocyanic acid. As for internal analgesics, when a quick but short action is desired, we use the general anesthetics and cocain. When a rapid and lasting effect is demanded, nothing is as prompt and certain as the opiates, remembering that children take them badly. When, in addition to pain, there is a marked restlessness, the addition of hyoscin hydrochlorate in minute dosage will markedly intensify and prolong the action of the morphin. To obtain any results with codein proportionately large doses must be used. During the administration of such doses there frequently has occurred the sudden appearance of toxic symptoms.

Heroin is very inferior to either morphin or codein, except in painful coughs. In these it is the equal of morphin and has the advantage of not arresting the secretions. In safe doses the chief effect of chloral is to produce sleep. To relieve pain requires doses of dangerous size. This drug also tends to irritate the gastrointestinal tract. Antipyrin and acetanilid are very useful as analgesics, but not free from danger. They are not as efficacious when the pain is of the inflammatory type. Phenacetin has a parallel therapy, but is far safer. When a weak but prolonged action is demanded aspirin is chiefly indicated in those cases in which the salicylates are beneficial. Chloralamid takes several hours to act, but the analgesic effect is very prolonged, although weak. When a weak and short action is required the bromids act well, chiefly when irritability of the nervous system predominates. Analgesics have a very restricted use in pediatric practice because so few are not dangerous to use during childhood; but they have a wide field of usefulness, because children do not bear pain well; they bear it patiently, but its physical effects are proportionately great. Analgesics during childhood are all more or less transient in their effect, except in the case of a very few of the weakest ones; they are all more or less objectionable, because of the liability to the formation of the drug habit, of the irreparable damage done to a developing nervous system when their use is prolonged, of the dangers of overdosage and of the irritant effect

of most of them. They must be given only when absolutely necessary and when their external and local use would probably fail to relieve. They must not be given as to obscure the diagnosis. The cause of pain must be removed whenever possible before the internal administration of an analgesic. The drug must be changed from time to time to avoid tolerance and habit. The dose should be small and frequently repeated instead of an initial large dose.

Stimulants in Pediatric Practice.—Sara Well-Kakels (*Arch. Ped.*, May, 1908) says that although many of the diseases of childhood run a typical course, the indications are to place the patient in the most favorable condition and assist the defensive agencies of the system to overcome the deleterious effect of disease. Recovery from disease depends greatly on the relative integrity of the heart muscle; and the prevention of cardiac impairment, which threatens the child even more than the adult, is to be accomplished not so much by giving cardiac stimulants early at the outset of the disease as by avoiding drugs which have a depressing effect on the heart or such as derange the stomach. Alcohol is one of the best cardiac stimulants and is well tolerated by children. It is usually required in the precritical stage of lobar pneumonia, in protracted illness and mainly during defervescence and convalescence, when the strength is depressed and the pulse soft and compressible. It is most beneficial in septic cases with asthenia, as in diphtheria and septic scarlet fever. At the onset of signs of cardiac weakness in acute fevers, shown by weakened first sound, accelerated pulse-rate and reduction of arterial tension, besides alcohol the use of digitalis, strophanthus or strychnin is indicated. The cumulative effect of digitalis is more apt to be seen in children than in adults. Tincture of strophanthus similar in action to digitalis; it has no cumulative effect and may be used for a longer time. One of the most useful drugs in combating myocarditis, cardiac irregularity with a moderately soft and intermittent pulse, is strychnin. Digitalis should be used in the treatment of chronic cardiac disease only when signs of failing compensation appear. Long-continued use of this drug in small doses in these cases is not commendable. In children with congenital heart lesions with communicating ventricles, digitalis should be employed only when signs of myasthenia become evident with constant dyspnea and very small radial pulse. In extreme cases of heart failure full doses of strychnin, caffeine, camphor and whiskey may be given alone or in combination. In a group of cases of pulmonary inflammation we have to deal with a weakness principally of the right side of the heart. In these relief may be attempted by giving nitroglycerin. By its effect upon the vaso-motor nerves the blood-pressure is lessened and peripheral vessels dilated; thus, the overcrowded lesser circulation may be relieved. These cases also call for oxygen. If circulation cannot be restored by these measures venesection may give immediate relief. According to Heubner, children will bear the withdrawal

of one-tenth of the entire blood, which again forms one-thirteenth of the body weight, that is, of about one-one hundred and thirtieth. Hypodermoclysis is a therapeutic measure of great value which stimulates the heart and raises arterial pressure.

Reduction of Infantile Mortality.—W. C. Phillips, Secretary of the Milk Committee of the New York Association for Improving the Condition of the Poor (*Med. Rec.* May 30, 1908), favors for reducing infantile mortality, the establishment on a large scale of consultations on infant hygiene in New York City, organized in a simple, inexpensive manner, after the pattern of the Consultations des Nourrissons in France. Their object should be: (1) The education of mothers in the care of babies up to the age of two years; (2) the encouragement in every way of breast feeding; (3) the education of mothers in pasteurizing, sterilizing and modifying milk in the homes. Groups of twenty or twenty-five mothers could be collected and the clinic or consultations held in churches, settlements, day nurseries, and other similar institutions. In this work the enthusiasm and unselfish co-operation of physicians is essential. Technical differences of treatment should be set aside and every effort centered on inculcating recognized fundamental principles of hygiene. To economize time and effort two or even more physicians might work together in the same class, giving, say, one hour of the week, or one hour of every other week, for a fixed group of infants. Babies should be weighed weekly in the presence of the group of mothers. The secretary would keep weights and statistics of the babies. Charts showing the natural and actual increase in each infant's weight should be kept and shown to the mother as an incentive to care properly for her child.

Prophylaxis in Children's Hospitals.—Henry Koplik (*Lancet*, May 23, 1908) says that a hospital for children should be so constructed that the wards can be cut off from each other, so that in case of an epidemic in one ward this can remain isolated, allowing the other wards to continue their service. There should be a well-conducted reception ward where children are detained for twenty-four hours after admission for close study as to the throat, eyes, eruptions on the skin, and in female children conditions of the genitals. If a vaginal discharge is present a patient should not be bathed in the general bath-tub, but be cleansed in her own bed and the discharge examined bacteriologically. All throats are examined and if there is the least suspicion of inflammation a culture should be taken. If an eruption should exist on the body, the patient is immediately isolated in a separate room and a special nurse, or a nurse who does not come in contact with the other children, is put in charge of the case until its nature is decided. Each bed should be so raised from the floor that the mattress is at a convenient height for the examination of the little patient and is away from the dust of the floor. Each bed is armed with its own thermometer and at the beside there is a table, one table for two beds, containing two drawers; in each

drawer each patient should have a large basin, numbered with the number of the bed, which is to be used for washing the body and face, and a smaller sized basin about as large as a finger bowel for washing the buttocks in nurslings. If a child has a vaginal discharge, the bed is marked with a red ticket or bandage. The linen of such a bed is marked with the initials "V.D." (vaginal discharge) so that the nurse knows clean linen should not be used on such a bed. In addition, the female children are all diapered with cheese-cloth and in the older children there is underneath the diaper a small gauze sanitary pad. As far as nurslings are concerned a diaper once used is thrown away. Female children of an older age should each have a bedpan of their own, marked with the name and the number of the bed to avoid transmission of a vaginal discharge. Patients with vaginal discharge should not have their temperatures taken in the rectum for two reasons; first, the thermometer is infected; and, second, a drop of pus on the perineum may easily be introduced into the rectum by the thermometer and proctitis result. The writer uses no diapers except of cheese-cloth, destroyed after use, and permits no tooth or hair brushes, as these are liable to become mixed. The mouths of nurslings are not washed unless sprue appears, and then with a swab, not the finger.

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ORIGINAL COMMUNICATIONS.

AN EXPERIMENTAL STUDY ON HEMORRHAGE FOLLOWING SECTION OF THE UTERINE AND OVARIAN VESSELS IN DOGS AND ITS POSSIBLE BEARING ON RUPTURED PREGNANCIES.*

BY

HUNTER ROBB, M. D.,

Professor of Gynecology, Western Reserve University, and Visiting Gynecologist to the Lakeside Hospital, Cleveland, Ohio.

(With illustrations*)

PHYSIOLOGISTS have estimated the total quantity of blood in the human body at about 7.7 per cent. of the body-weight. Thus, a woman weighing 130 pounds would have a blood content of about ten pounds.

Now "just what percentage of loss"—to quote from Howell—can be borne by the human being has not been determined, but it is probable that a healthy individual may recover without serious difficulty from the loss of a quantity of blood amounting to as much as 3 per cent. of the body-weight." This, in a woman of 130 pounds, would be a loss of four pounds, or approximately 1,650 c.c. We question whether so large an amount or, at any rate, much more blood is found in the average patient of the above weight as a result of the hemorrhage resulting from a ruptured ectopic gestation.

During the past nineteen months we have been conducting a series of experiments on dogs to see if it might not be possible to throw some light on this phase of the subject from the standpoint of hemorrhage.

These experiments, so far as we have gone, (thirty-one exper-

*Read before the American Gynecological Society, at Philadelphia, May 26 to 28, 1908.

iments) seem to show that, in dogs at least, hemorrhage from large internal vessels ceases before it is sufficient to prove fatal. No dog succumbed to the hemorrhage following excision of the ovary, division of the broad ligament with section of the left uterine vessels, section of the uterine vessels on both sides and other lesions. In none of these cases did the dog succumb to the hemorrhage although we probably subjected our animals to as great a risk of bleeding to death as is incurred by the average woman suffering from a ruptured tubal pregnancy.

Before taking up in some detail the findings in our experimental work I would like to briefly recall to your memory the anatomy of the parts. In the bitch the uterus consists of the body or corpus and its two long horns or oviducts; in the latter fetal development takes place. The oviducts are connected anteriorly with the very short, slender Fallopian tubes; the outer ends of the latter lie very near the ovaries, which are situated posterior and dorsal to the kidneys. Each uterine artery is a branch of the pudic, the latter being one of the two main divisions of the internal iliac; they are vessels of considerable size, even as compared with the corresponding arteries in women. The ovarian vessels, on the other hand, are quite small. (V. Figs. 1 and 2.)

With these anatomical differences in mind, a résumé of the cases is herewith presented:

The experiments carried out may be divided into the following series:

1. Division of the uterine and ovarian vessels.
2. Division of the uterine vessels producing shock. Secondary operation on dog while in a condition of shock.
3. Division of the uterine vessels and observations on the blood-pressure and hemoglobin.
4. Division of the uterine vessels and observation on the pulse, respiration and hemoglobin with special reference to the time of the clotting of the blood.
5. Division of the vessels, observations on the pulse, respiration and hemoglobin before and after bandaging and before and after applying weights to the lower abdomen.
6. Division of the uterine vessels with the dog in the upright position; observations on the pulse, respiration and hemoglobin.

EXPERIMENTS.

Series No. 1. Division of the Uterine and Ovarian Vessels.
In this series we have carried out excision of the ovary, divi-

EXPLANATION OF PLATES.

The diagrams afford a comparison between the uterine artery in the human being and that in the dog. FIG. I, which shows the artery in the human subject, is a composite picture of the diagrams in Corning's and Gray's Anatomies. FIG. II, which shows the distribution of the uterine and ovarian arteries in the dog, was made after injecting the blood-vessels.

It will be seen that in the human being, at the points at which the uterine comes off from the anterior branch of the internal iliac, there is a much sharper angle than in the dog.

In order to show the course of the uterine artery in the dog the uterus with the oviducts was placed over the symphysis pubis.

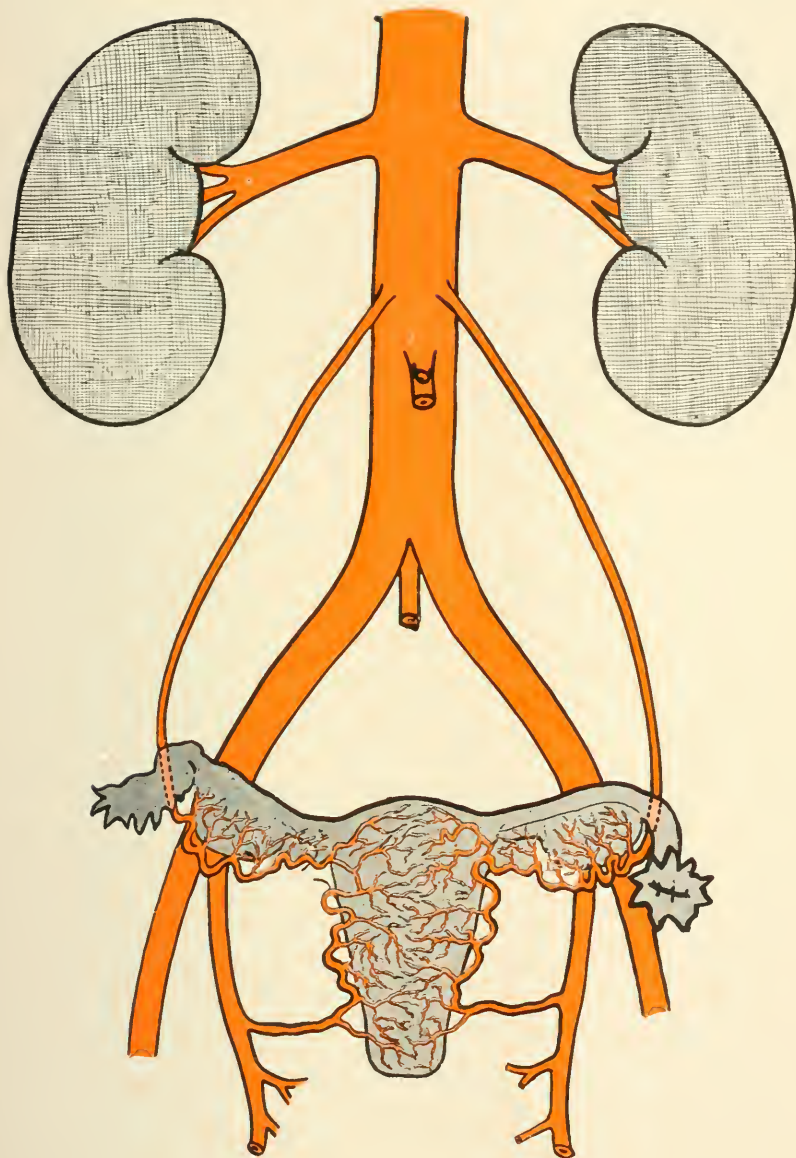


DIAGRAM OF THE DISTRIBUTION OF UTERINE AND OVARIAN ARTERIES
IN THE HUMAN SUBJECT.—*Robb.*

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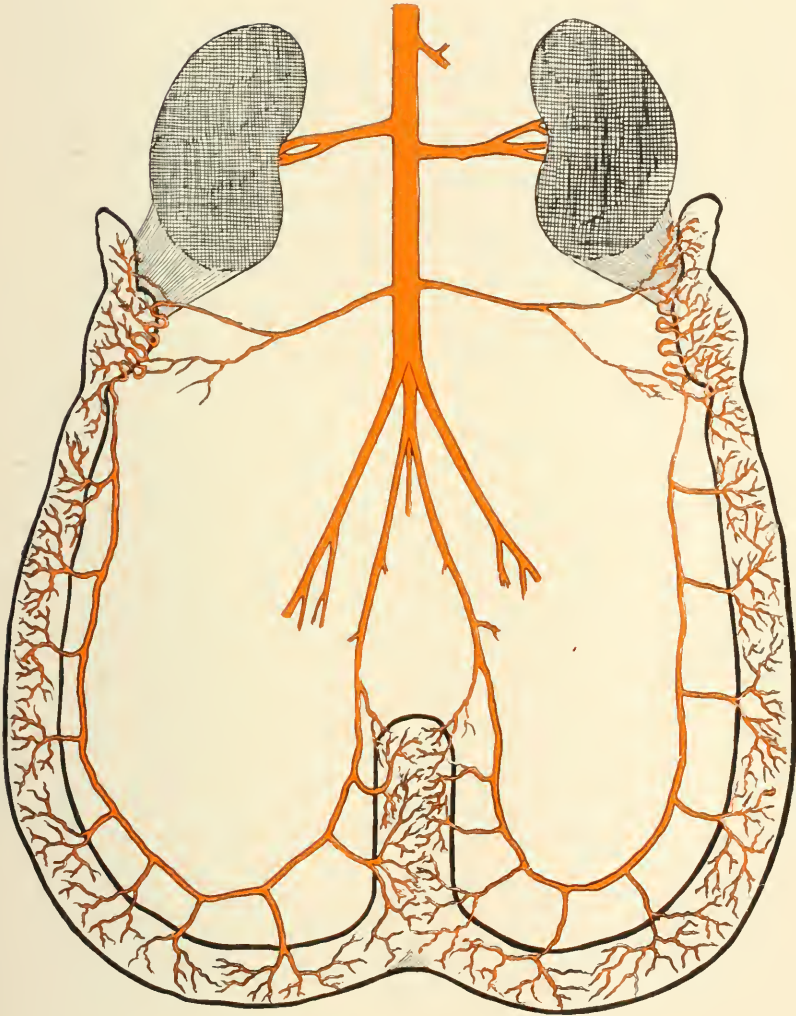


DIAGRAM OF THE DISTRIBUTION OF UTERINE AND OVARIAN ARTERIES
IN THE DOG.—*Robb.*

sion of the broad ligament with section of the left uterine vessels, section of the uterine vessels on both sides and other lesions. In none of these cases did the dog succumb to the hemorrhage.

Dog No. 1.—Well nourished. Weight 6.5 kilos.

January 11, 1907. Ether anesthesia. The abdomen was opened through a median incision 6-7 cm. long. Pelvic organs apparently normal. The outer end of the right oviduct was cut through, and the right ovary excised. There was no free bleeding at the site of the injury. The incision was closed in layers. There was but little variation in the pulse throughout the operation. Quick recovery from ether and an uneventful convalescence.

Dog No. 2.—Well nourished. Weight about 12 kilos.

January 25, 1907. Ether anesthesia. Median incision 4 cm. long. Pelvic organs apparently normal. The right broad ligament was cut through its entire extent, the uterine vessels being severed. There was active arterial hemorrhage, the blood welling up into the abdominal wound. Incision quickly closed in layers. At the end of the operation the mucous membranes showed a distinct blanching. Pulse 140, of small size. Dog conscious thirty minutes after being put to bed. A good deal of vomiting during first six hours.

January 26. Dog is up and walking about, showing no signs of pain. This dog escaped from her cage several days later. She had made a good recovery, so far as we could judge.

Dog No. 3.—Good condition. Weight about 10 kilos. "In heat."

January 30. Ether anesthesia. Median incision 4 cm. long. Pelvic organs congested. Outer end of left oviduct cut through and left ovary excised. The left uterine vessels were now cut across. Free bleeding from the latter and also from the ovarian. Incision quickly closed in layers. At end of operation pulse of rather small volume, rate not obtained. Dog conscious soon afterward.

February 2. Condition good. Dog disposed to remain quiet.

February 6. Dog bright and active, taking her food well.

Dog No. 4.—Well nourished. Weight about 10 kilos.

February 2. Ether anesthesia. Median incision 4 cm. long. Pelvic organs normal. The uterine vessels on both sides were cut across. Very free bleeding. Incision quickly closed in layers. Pulse rapid, but of fairly good volume. Dog conscious before leaving the table. Given morphine gr. $\frac{1}{3}$ hypodermically at once. Thirty minutes later dog was standing and drinking water greedily.

February 6. Dog suffered apparently but little from operation. To-day seems bright but is not disposed to move about much.

February 16. Dog made an uninterrupted recovery.

Dog No. 5.—Feb. 6. In good condition. Weight about 10 kilos. Normal pelvic organs. The left ovary was excised, and the uterine vessels on both sides were cut. There was the usual

free hemorrhage. Immediate closure in layers. Dog conscious on reaching bed. Pulse not very rapid and of good volume. Seen thirty minutes later, dog had changed position, but was then perfectly quiet.

February 9. Dog had been doing well. Yesterday was eating. To-day does not appear so bright. Does not object to being moved. Pulse and temperature normal.

February 16. Rapid improvement since last note. Dog now active.

Dog No. 6.—This is the same animal used in Experiment No. 1 (q.v.).

February 9. Dog had made a complete recovery from first operation. Ether anesthesia. Abdomen reopened through former incision. No free fluid or clotted blood found in peritoneal cavity. A few delicate adhesions about the pelvic structures. The right oviduct was enlarged and bent upon itself. In the left oviduct were two fusiform swellings, the one about 1.5 cm. from the corpus uteri, the size of a pigeon's egg; the other in the outer half of the oviduct, almost as large as a duck's egg, apparently filled with clear fluid. The uterus and oviducts were now removed *in toto* by one continuous cut of the scissors from side to side. Bleeding was profuse. Immediate closure in layers. At end of operation pulse hard to obtain; respirations shallow. Dog able to open her eyes. Seen fifteen minutes later dog was standing on all fours, lapping water.

February 16. Dog did not appear to be suffering from operation. A few hours afterward was walking about in her cage. No sedative was given. At present seems to be in good condition.

February 25. Dog has apparently made her second complete recovery. Incision well healed.

Dog No. 7.—Same animal as No. 3 (q.v.). The first operation had been made seventeen days before. The left ovarian and uterine vessels were cut. Dog has made complete recovery. Now bright and lively.

February 16. Ether anesthesia. Abdomen reopened through former incision. No blood found in peritoneal cavity. A few light omental adhesions. No pulsation could be detected in the stump of the left uterine artery, nor was there any clot around it. The right uterine vessels were now cut, and temporary closure of the abdominal cavity was made by placing clamps on the edges of the divided peritoneum. At the beginning of the operation the pulse-rate was 128. The dog was now kept under a light anesthesia. Fifty minutes after cutting of vessels the pulse began to show an increased rate, being at this time 136. A steady rise continued during the next thirty minutes, at the end of which time the rate was 156. The clamps were now removed from the peritoneum, and the blood found in the pelvis was carefully removed with gauze sponges. After gentle application with a gauze sponge at the cut end of the artery cessation of the bleeding resulted at the end of about ten minutes. Twenty minutes later a subcutaneous infusion of salt solution (400 c.c.)

was given. This was nearly all taken up in thirty minutes. It was given to see if the subsequent rise in the blood-pressure would bring on a recurrence of hemorrhage from the uterine artery. No such effect was produced at the end of thirty minutes after the absorption of the saline solution. Gentle squeezing of the end of the vessel, however, was sufficient to expel the clot, which had formed, and fresh bleeding began. The experiment was brought to a close at this point, the uterine artery ligated, and the incision closed in layers at once. The pulse-rate at the end of $3\frac{1}{2}$ hours consumed in the observation was 144.

February 25. Dog has done well from day of operation. Is now as active as ever. The amount of blood lost during the experiment was estimated approximately and found to be 240 c.c.

Dog No. 8.—Young bitch. Poorly nourished. Weight about 4 kilos. Mucous membranes pale.

February 25. Median incision 6.5 cm. long. Uterus very small, the oviducts slender, cord-like structures. Evisceration of both ovaries, the uterus and oviducts *in toto*. There was very free bleeding from all the vessels. Immediate closure in layers. But slight change in pulse during operation. Fifteen minutes later dog appeared to be having a hard, shaking chill. Was conscious, but not able to hold up her head.

February 26. Dog is bright, but moves about very little.

March 1. Dog appears to be gaining rapidly. Is now walking about her cage. Very anemic. Ether anesthesia. Abdomen reopened through previous incision. No free blood in peritoneal cavity. Omentum and intestines adherent in places to bladder, pelvic wall and rectum; all easily separated. Around the stump of the uterus a small blood-clot was adherent. No other clots present. Forcible manipulations of the stumps of the uterine vessels produced no active bleeding, only an oozing. Dog went into sudden collapse. Revived by artificial respiration.

Dog No. 9.—In good condition. Weight about 4.5 kilos.

February 26. Ether anesthesia. Median incision 6.5 cm. long. Total evisceration of intra-abdominal genitalia as in previous animal. Profuse hemorrhage. Immediate closure in layers. Mucous membranes became greatly blanched. At close of operation pulse-rate was 180, shortly afterward becoming almost imperceptible. Soon after reaching bed dog was conscious, but made no attempt to move.

March 2, Dog is bright and fairly active. Mucous membranes quite pale. Ether anesthesia. Abdomen reopened through previous incision. No fluid or clotted blood present in peritoneal cavity. Stump of corpus uteri brought up and found surrounded by a small clot. No distinct pulsation to be made out in uterine vessels. Well-marked oozing caused by active manipulations of pelvic structures, increased by freshening cut surfaces of previous operation. Closure in layers. Pulse rapid, but of good volume at end.

Dog. No. 10.—In excellent condition. Weight 17.5 kilos.

March 15. Ether. Median incision. Uterus very small for so large an animal (has never been pregnant). Uterine vessels cut on both sides. Bleeding by no means so free as in previous cases. Closure in layers. Pulse good at close.

March 18. Dog appears as well as before operation.

Dog No. 11.—In fairly good condition. Weight about 6 kilos. Considerable enlargement of both thyroids.

March 18. Ether. Median incision. Pelvic organs normal. Uterine vessels of average size. Cut on both sides. Bleeding very free. Immediate closure. Pulse rapid, but of pretty good volume.

March 19. Dog to-day is bright and playful. Abdomen reopened under ether; one to three drams of bloody fluid present, and a small blood-clot on each broad ligament at site of cut ends of uterine vessel. Removal of clot on right side brought on active arterial hemorrhage. Genital organs now excised *in toto*, the corpus uteri being cut across below level of previous division of uterine vessels. There was profuse bleeding, probably two ounces escaping from abdominal cavity before closure was made. At the end of operation pulse was rapid and of small size. Mucous membranes greatly blanched. Dog able to hold up her head on reaching cage, but making no attempt to rise.

March 20. This morning dog appears to have recovered well from yesterday's operation. Gets around well. While ether was being administered again dog ceased breathing, and all measures for resuscitation failed. About 6 c.c. of fluid and clotted blood found between bladder and intestines. Intestinal serosa pale.

Dog No. 12.—Young bitch in fairly good condition. Weight 5 kilos.

March 21. Ether. Median incision. Uterus quite small, but vessels of good size for age of dog. Right uterine vessels cut. Free arterial hemorrhage. Immediate closure. Pulse of good volume, not very rapid.

March 22. Dog all right to-day. Ether. Abdomen reopened; 8-10 c.c. of bloody fluid and blood-clots present. Left uterine vessels were cut and bled freely.

March 23. Dog seems rather weak to-day, but is able to get around well. Abdomen reopened. About the same amount of blood present as found yesterday. Manipulation of uterus and broad ligaments caused fresh bleeding from uterine vessels. Dog conscious at close.

March 26. Dog somewhat dull to-day. Incision infected and gaping. Killed by forced anesthesia. Several cubic centimeters of purulent fluid found in pelvis. (Portion of femoral vein removed for study.)

Dog No. 13.—In good condition. Weight about 9 kilos.

March 25. The abdomen was opened in the median line. Each oviduct was occupied by four fetal sacs. It was estimated that the dog was about one-third along with her pregnancy, the period corresponding to the third month of gestation in the human being. The blood-vessels in the broad ligament were di-

lated, the uterine artery measuring 2 mm. in diameter at the junction of the oviduct and the body of the uterus. The right uterine vessels were incised at this point, the bleeding was profuse, and the abdomen was closed while the bleeding was going on. After the closure of the abdominal incision the femoral pulse could just be made out. The mucous membranes were very pale. Fifteen minutes later the dog lay stretched out with her eyes open and breathing quietly, but the femoral pulse could not be made out.

March 26. The dog appears dull, but walks around without any difficulty. Pulse small, 140 to the minute. She was given a subcutaneous infusion of 200 c.c. of normal saline solution.

March 27. Condition of dog good. Pulse 104, regular and of fairly good size. Abdomen was reopened and several cubic centimeters of bloody fluid and clots were found. The proximal ends of the cut uterine vessels were closed, but good pulsation was present in the artery. The fetal sacs of the left side were brought out and opened with longitudinal incisions, which were further torn apart with forceps. These tears were made from the dorsal sac inward on the inferior, the superior, the anterior, and the posterior surfaces of the oviduct respectively. This procedure was followed by rather free bleeding from one torn sac. The abdomen was closed. One hour following the operation the dog was still prostrated—with a pulse 120, but of fairly good volume.

March 28. Dog in excellent spirits, quite active. Abdomen reopened under ether narcosis. A small quantity of fluid and clotted blood present. Good pulsation present in proximal stump of right uterine artery. Distal portions of the right vessels severed again and the fetal sac adjacent to the body of the uterus on this side torn apart. All the left sacs were again cut open in different places, and the left uterine vessels were severed. There was the usual free hemorrhage. Dog conscious on reaching bed, pulse very rapid and small.

April 2. Dog rather dull yesterday and to-day, but gets around well. Has shown no symptoms of pain. This morning the abdomen was reopened for the fourth time within a period of nine days. Several cubic centimeters of dark bloody fluid were present. Bladder much distended. Omentum adherent to fetal sacs. The left uterine vessels were thrombosed in their severed ends. Definite pulsation in the artery could not be made out on either side. The uterus, together with the fetal sacs, was now removed. The bleeding from the freshly cut uterine and ovarian vessels was very free. Abdomen closed. At the end of the operation the femoral pulse was 140 to 150, irregular and small. Mucous membranes much blanched. A tight binder was placed around the abdomen and the dog left in the Trendelenburg position. Three hours later the condition was about the same. Three hundred and twenty-five cubic centimeters of a saline solution given subcutaneously, with slight improvement of the pulse.

April 3. Twenty-four hours after the last operation the dog was found in much better condition, able to be on her feet and taking nourishment readily. Pulse 120, regular and of fairly good volume.

Dog No. 14.—Small fox-terrier bitch, pup, black and white, with yellow face. Weight 10 pounds.

February 10, 1908. 12.00, anesthetic started. Pulse 160. Two inch median incision made. Right ovary, uterus and oviducts excised. No ligatures placed. Wall incision closed in layers. Pulse at end of operation 140. Dog placed in pen.

5.00, Pulse 160. Dog drinking water this afternoon, and when taken out of pen walks back.

February 11. Dog eating and apparently in good condition, but remains rather quiet.

February 13. Dog sluggish, eats a little, drinks water, walks about a little, but seems to want to be quiet.

February 15. Dog ate last night apparently as usual. Found dead this morning.

Autopsy. Wound looks clean but has not united firmly. Under the incision there is a mass of clotted bloody fluid matting the bowels together, and uniting them to abdominal wall. No firm adhesions found here. There is some free dark bloody fluid in abdomen. (Smears taken later from this and stained, showed long coarse square-ended bacilli. Cultures on agar showed no growth.) The intestines are matted together in semi-solid blood-clots. The omentum is matted into a mass on the left side. Intestines clear. Liver, spleen and pancreas appear normal. Heart and lungs normal. The uterine stump is covered with a firm blood-clot and a few fine adhesions.

We have recently carried out two experiments to determine what effect would be produced by cutting the uterine veins alone. It has been said that the bleeding from a ruptured ectopic is for the most part venous in character, and will keep up indefinitely if the vein alone is injured. In neither of our experiments were we able to prove that such is the case, as in each instance as will be seen by consulting the details of the experiments, the dogs recovered.

The two dogs experimented upon are numbered 30 and 31 respectively, as the experiments were carried out recently, but they can best be introduced in this series of experiments.

Dog No. 30.—June 6, 1908. Brindle bull bitch. Weight 17 pounds.

11.15. Pulse 128.

12.00. Anesthetic started.

12.15. Pulse 180. Resp. 80. Hemoglobin 88.

12.17. Abdominal incision made.

12.20. Pulse 160. Resp. 96. Hemoglobin 88.

12.21. Left uterine artery cut and tied. Right uterine veins cut—the artery being left intact.

12.25. Pulse 168. Resp. 84.

12.30. Pulse 160. Resp. 92.

- 12.38. Pulse 180. Resp. 90. Hemoglobin 84.
 12.45. Abdomen closed. Morph. sulph. gr. $\frac{1}{2}$ given hypo.
 12.55. Hemoglobin 80.
 1.00. Pulse 108. Resp. 88.
 1.45. Pulse 104. Resp. 44. Hemoglobin 82.
 June 7. 2 P. M. Dog active, running about so that bandages are completely off. Wound left unprotected. Hemoglobin 82.
 June 12. Uneventful recovery.
 June 23. Perfectly recovered.
 Dog. No. 31.—June 16, 1908. Long black-haired bitch.
 Weight 16 pounds.
 11.15. Anesthetic started.
 11.30. Pulse 180. Resp. 40. Hemoglobin 100.
 11.35. Hemoglobin 102.
 11.37. Incision made.
 11.40. Pulse 132. Resp. 32.
 11.46. Right uterine vein cut.
 11.50. Pulse 136. Resp. 28.
 11.52. Left uterine vein cut. Both arteries left intact and pulsating.
 11.55. Pulse 102. Resp. 20. Hemoglobin 95.
 12.03. Abdomen closed.
 12.10. Morph. sulph. gr. 1 hypo.
 12.25. Hemoglobin 94.
 1.35. Pulse 160. Resp. 20. Hemoglobin 94.
 June 17. Dog active—eating.
 June 23. Uninterrupted recovery.
Résumé.—In this series we have sixteen observations.
 I would like to call attention to the experiments carried out in

Dogs No. 7 and 13 as they are of rather unusual interest.

In Dog No. 7 after cessation of the bleeding we injected subcutaneously 400 c.c. of normal salt solution. This procedure seemed to exercise a general beneficial result but brought about no recurrence of the hemorrhage. This observation would go toward refuting the view of Fritsch, who says "To give subcutaneous saline infusions before the operation is wrong. I advise them directly after the operation."

Dog No. 13, who was about one-third along with her pregnancy, was operated upon four times within a period of nine days. At the first operation the right uterine vessels were incised. At the second operation (two days after the first) the fetal sacs on the left side were opened by longitudinal incisions. At the third operation (day after second operation) the distal portions of the right uterine vessels were severed again, and the fetal sacs on the right side were torn open, the left sacs were again cut open in different places and the left uterine vessels were severed. At the

fourth operation (five days after the third operation) the uterus together with the fetal sacs were removed. (No vessels were tied or clamped at any of the operations). Twenty-four hours after the last operation the dog was able to be on her feet and took nourishment readily.

*Series No. 2. Division of the Uterine Vessels Producing Shock.
Secondary Operation on Dog while in a Condition of Shock.*

Dog No. 14.—February 7. Black and white short-haired bitch, spotted black and white face. Weight 26 pounds.

9.55. Anesthetic started.

10.25. Operation started. Pulse 200. Resp. 88. Three-inch median incision. Oviducts and uterus very vascular, bladder distended.

10.45. Right uterine vessels cut. Pulse 204.

10.50. Apex beat of heart cannot be felt.

10.55. Apex beat of heart cannot be felt. Mucous membranes paling. Resp. 140. Anesthetic stopped.

10.56. Resp. 72; Cheyne-Stokes type.

11.00. Apex beat not palpable. Tongue and mucous membranes gray.

11.05. Apex beat not palpable. Tongue and mucous membranes gray. Dog seems to be coming out from anesthetic.

11.10. Dog well out from under anesthetic. Tongue blanched. Pulse not perceptible.

11.15. Apex beat feeble. Pulse about 140. Color of mucous membranes better.

11.20. Abdomen opened again. Three ounces of bloody fluid sponged out. Bladder tapped, emptied and dropped back into cavity. The oviducts and incised vessel manipulated. The cut vessels were found oozing, but not markedly.

11.23. Apex beat feeble. Resp. 64; good.

11.24. Apex beat feeble. Resp. 100.

11.25. Pulse taken at left uterine artery, 200 per minute.

11.30. Apex beat feeble. Resp. good. Mucous membranes improving in color.

11.40. Apex beat palpable, but rate cannot be counted. Resp. 32. Apparently failing. Artificial respirations begun and continued until 11.55.

11.55. Dead. A fairly good-sized clot was found at point at which right uterine vessels had been severed.

Résumé. In this dog the right uterine vessels were severed and the abdomen was closed while the vessels were bleeding. After an interval of 35 minutes the dog's pulse was 204, and it fell to 140 before the abdomen was opened again. On opening the abdomen the second time we manipulated the abdominal contents in very much the same manner as would be carried out in doing an operation for a ruptured ectopic pregnancy.

The abdomen was then closed. In thirty-five minutes after this the dog expired, either from the effects of the operation, or of the anesthetic, or from a combination of these factors. This experiment, while only a single observation, is at least suggestive that the addition of shock to shock—which is precisely what we bring about when we submit a woman to an immediate operation for ruptured tubal pregnancy—is very likely to prove fatal.

Series No. 3. Division of the Uterine Vessels and Observations upon the Pulse, Respirations, Blood-pressure and Hemoglobin.

Dog No. 18.—February 28. Brown long-haired bitch pup. Weight 12 pounds. Before starting anesthetic pulse 132.

11.20. Anesthetic started.

11.40. Pulse 162. Resp. 46

12.00. Pulse 180. Resp. 52. Hemoglobin 120.

Mercury manometer connected with femoral artery. Blood-pressure 130 mm. of mercury.

12.05. Pulse 182. Resp. 80.

12.06. Abdominal incision made.

12.10. Morph. sulph. gr. $\frac{1}{2}$ hypo. Uterine vessels on one side were cut.

12.15. Blood pressure 100 mm. of Hg.

12.20. Pulse 108. Resp. 60. Hemoglobin 98.

12.25. Pulse 124. Resp. 66.

12.30. Pulse 104. Resp. 120.

12.35. Pulse 132. Resp. 180. Hemoglobin 110.

12.40. Pulse Resp. 108.

12.45. Pulse 134. Resp. 162. Blood-pressure 90 mm. of Hg.

12.50. Pulse 120. Resp. 168. Hemoglobin 98

12.52. Abdomen reopened and clot removed from cut end of vessels.

1.15. Pulse 128. Resp. 168.

1.30. Morph. sulph. gr. $\frac{1}{2}$ hypo.

1.40. Abdominal wall closed.

3.00. Dog walking around.

February 29. Dog appears to be feeling fairly well to-day.

March 3. Dog no very active. Acts as if she were toxic.

March 4. Died to-day. Abdominal wound gangrenous, having completely broken down. No free fluid nor blood in abdominal cavity. Over the cut end of vessels there is a well-formed clot. Between the uterus and bladder there are a few fine adhesions. Liver and spleen enlarged and soft. Other organs apparently normal.

Dog. No. 15. February 12. White bull bitch. Weight 34 pounds. Before operation pulse 180–200. Hemoglobin 127.

11.32. Both uterine and ovarian vessels cut.

11.35. Morph, sulph. gr. 1 hypo.

11.48. Pulse 180. Resp. 60.

11.55. Pulse 152. Resp. 90 (shallow).

12.00. Hemoglobin 115.

- 12.10. Pulse 140. Resp. 72.
 12.15. Pulse 132. Resp. 60. Hemoglobin 115.
 12.25. Morph. sulph. $\frac{1}{2}$ gr. hypo. Pulse 132. Resp. 50.
 12.30. Abdomen reopened and six ounces of bloody fluid sponged out.
 12.35. Pulse 140.
 12.45. Pulse 136. Resp. 30.
 1.00. Pulse 120. Resp. 30.
 Dog remained dazed and sleepy all afternoon.
 February 13. Dog lively. Seems to be feeling well.
 February 17. Dressings removed. Incision broken down. Edges edematous and a bloody serous fluid discharging from wound. Rbc. 6,956,000. Hemoglobin 110.
 February 18. Dog lively, eating, feeling well.
 February 20. Wound nearly closed. Dog doing very well.
 March 2. Before operation pulse 160.
 10.20. Anesthetic started.
 10.35. Pulse 186. Resp. 28.
 10.45. Morph. sulph. gr. $\frac{1}{2}$ hypo.
 10.50. Ether discontinued.
 11.00. Began opening neck to insert cannula in left carotid artery. Pulse 198. Resp. 42. Hemoglobin 130.
 11.10. Morph. sulph. gr. $\frac{1}{2}$ hypo. Resp. 28.
 11.20. Mercury manometer connected with left carotid artery. Blood pressure 120 mm. of mercury.
 11.25. Abdominal incision made.
 11.30. Morph. sulph. gr. $\frac{1}{2}$ by hypo.
 11.32. Right uterine vessels cut on uterine stump.
 11.34. Abdominal wall closed with hemostatic forceps.
 11.37. Pulse 180. Resp. 42. Blood-pressure 120 mm. of Hg. Hemoglobin 120.
 11.45. Pulse 172. Resp. 48.
 11.50. Blood-pressure 110. Hemoglobin 115.
 12.15. Abdomen opened. Pretty well filled with bloody fluid. A fairly well organized clot found over the cut end of right uterine vessels. There was no active bleeding until after pelvic contents had been manipulated, then the blood welled up out of abdominal incision.
 12.25. Closure of abdominal wound begun.
 12.30. Morph. sulph. gr. $\frac{1}{2}$ hypo. Pulse 168. Resp. 32. Blood-pressure 110. Hemoglobin 115. Dog remained sleeping remainder of afternoon.
 March 3. Dog lies quietly this morning.
 March 5. Dog feeling well, walking around.
 March 15. Dog perfectly recovered.
 April 23. Hemoglobin 105 per cent.
Résumé. In Dog No. 1 of this series the blood-pressure had dropped from 130 mm. of mercury to 100 mm. of mercury within five minutes after the uterine vessels had been cut, and in 30 minutes more the blood-pressure was 90 mm. of mercury.

During this period of time the hemoglobin fell in all 22 points (from 120 to 98).

In another experiment (this dog had been operated upon five days previously), both ovarian and uterine vessels having been cut, the hemoglobin fell from 127 to 115 in forty-three minutes. Five days after the operation the hemoglobin was 110. Eleven days afterward a second operation was carried out similar to that upon Dog No. 1 of this series. The blood-pressure which was 120 mm. of mercury, one hour after section of the right uterine vessels, fell to 110. The hemoglobin at the beginning of the experiment was 130 and fell to 115 an hour after the cutting of the vessel.

As might be supposed the blood-pressure falls slightly and the hemoglobin drops as usual immediately after division of the vessels. As soon, however, as the bleeding ceases the hemoglobin stops going down and remains stationary for a time, and the blood-pressure rises.

Series No. 4. Division of the Vessels and Observations of the Pulse, Respiration and Hemoglobin with Especial Reference to the Time of the Clotting of the Blood.

Dog No. 16.—February 18. Fox-terrier and bull bitch. Weight 16 pounds. Before starting anesthetic pulse 156. Respirations not taken. Hemoglobin 130.

9.55. Anesthetic started.

10.05. Pulse 180. Resp. 60.

10.25. Operation started. Pulse 176. Resp. 68.

10.35. Pulse 160. Resp. 60.

10.37. Left uterine vessels cut. Pulse 176. Resp. 52

10.45. Pulse 200+. Resp. 56.

10.55. Pulse 240?. Resp. 52.

11.00. Morph. sulph. hypo. gr. $\frac{1}{2}$. Hemoglobin 110.

11.05. Pulse 176. Resp. 32.

11.15. Pulse 160. Resp. 28. Hemoglobin 110.

11.30. Pulse 154. Resp. 24. Hemoglobin 110.

Bleeding in pelvis now practically ceased. There are numerous small blood-clots between intestines and bladder and over cut end of left uterine vessels.

11.45. Pulse 140. Resp. 33. Hemoglobin 110.

11.50. Pulse 132. Resp. 32.

11.54. Morph. sulph. gr. $\frac{1}{2}$ by hypo.

11.55. During last fifteen minutes there has been no fresh bleeding. Clots are firmer. Dog is resting quietly. Femoral pulse is regular and of good volume. Pulse and respiration about the same as at 11.50. Four ounces of bloody fluid sponged from abdominal cavity. There is a well-formed clot over the proximal cut end of uterine vessels. Clot removed and active bleeding started again (weight of this clot 1 gram).

12.50. Dog remained sleeping all afternoon.

February 19. Dog takes liquids, but not very active.

February 20. Dog walking around. Has eaten solid food to-day.

Hemoglobin to-day 115.

February 27. Dog's condition has gradually improved, although she is considerably emaciated. Bandages removed to-day leaving open a raw granulating broken down wound.

February 28. Dog was walking around this morning. Found dead this afternoon.

Autopsy. On opening the abdomen three loops of small intestines were found adherent to the abdominal wall immediately under the wound. Abdominal wall incision had completely broken down except the peritoneal layer. Muscle and skin layers widely retracted. No free fluid in abdominal cavity. No blood found. A few fine adhesions behind the bladder. Right uterine vessels seemed normal. Left uterine vessels thrombosed. Liver somewhat swollen. Other organs appear normal.

Dog No. 17.—February 21. Black and white fox and sky terrier bitch. Weight 21 pounds. Before anesthetic was started pulse 128.

10.30. Anesthetic started (ether).

11.10. Operation started. Hemoglobin 140.

11.15. Anesthetic stopped. Pulse 160. Resp. 56.

11.16. The uterine vessels on both sides cut, the stumps being dropped back into abdominal cavity with catgut guides attached to the broad ligaments.

11.20. Morph. sulph. gr. $\frac{1}{2}$ by hypo. Resp. 48.

11.25. Pulse 196. Resp. 64. Hemoglobin 130.

11.30. Morph. sulph. gr. $\frac{1}{2}$ by hypo.

11.35. Considerable vomiting and straining, then dog became very quiet.

11.35. Pulse 168. Resp. 150. Hemoglobin 125.

11.45. Pulse 200. Resp. 200.

11.50. Pulse 180. Resp. 180. Hemoglobin 125.

12.00. Resp. 150.

12.05. Pulse 156. Resp. 138.

12.10. Pulse 152. Resp. 104.

12.15. Abdomen reopened. Pulse 154. Resp. 66. No bleeding found. There are large clots on the left side. On drawing up the uterus and separating the clot on the left side the bleeding recommences. Same occurs on removing small clot from the right side.

12.30. Pulse 112. Resp. 56.

12.40. Abdominal wall closed.

4.00. Pulse 140. Dog slept all afternoon.

February 22. Dog active and feeling good. Hemoglobin 125. Dog made a very rapid recovery. Skin incision healed perfectly, and this dog was used again April 24 as Dog No. 20.

Résumé. In this series we endeavored to trace some con-

nection between the pulse, respirations and the hemoglobin values and the formation of the blood-clot, or in other words, the cessation of the bleeding.

In the first dog of this series, in eight minutes after the left uterine vessels had been cut the pulse had risen from 200 to 240, and the respirations were 52. In twenty-three minutes after the severance of the vessel the hemoglobin had fallen twenty points, but taken fifteen to thirty minutes later the hemoglobin showed the same reading. After the hemoglobin ceased going down the pulse and respirations began to improve, the pulse going to 154 and the respirations to 24. On reopening the abdomen we found a number of clots lying between the intestines and the bladder and around the cut ends of the vessels. One clot which weighed 1 gram was removed and active bleeding started up again. The abdomen was again closed. On Feb. 28, ten days after the operation; she developed a septic peritonitis from the infected abdominal incision and died.

We have carried out this experiment frequently enough in dogs to make us feel reasonably certain that from the hemoglobin readings alone we can tell the time at which the clot has formed in the vessels. In every instance in which the hemoglobin ceases to go down and the reading remains stationary (and this in our experience always occurs) and the abdomen is reopened a well-formed clot will be found occluding the vessels. I believe that the hemoglobin readings will be found very useful in cases of intra-abdominal hemorrhage from a ruptured ectopic pregnancy, and that when we see that the hemoglobin remains stationary we can feel confident that we are doing the best for the patient in not operating at once.

The experiments in this group of dogs may be divided into three distinct portions: (1) In the first the pulse and respirations become very rapid after the division of the uterine vessels, the pulse becoming in some instances so fast that it is practically impossible to count it. During this time the hemoglobin will fall from 10 to 20 points. This portion of the experiment occupies about 20 minutes. (2) During the next fifteen to twenty minutes the dog looks as if it would die, but the hemoglobin remains practically stationary. If the abdominal cavity is now reopened a well defined blood-clot will be found about the incised vessels and the pedicle, and the bleeding will have ceased. (3) During the third fifteen to twenty minutes the pulse and respiration start to improve again, and the dogs begin to show

evidences of reacting. As a rule, from then on the recovery is without incident.

Series No. 5. Division of Vessels, Observations on the Pulse, Respirations and Hemoglobin before and after Bandaging and after Applying Weights to the Lower Abdomen.

Dog. No. 19.—March 13. Small brown short-haired bitch pup. Weight 8 pounds.

10.45. Pulse 190. Resp. 48. Hemoglobin 85–90 per cent.

10.46. Abdominal incision.

10.50. The uterine vessels on both sides cut.

11.00. Abdomen closed (skin clamps used).

11.05. Pulse 200. Resp. 48. Hemoglobin 90. Tight pressure bandages applied.

11.10. Morph. sulph. $\frac{1}{2}$ gr. by hypo. Dog vomited almost immediately.

11.20. Pulse 150. Resp. 20. Hemoglobin 90.

11.35. Pulse 96. Resp. 24.

12.35. Pulse 100. Resp. 12.

3.00. Pulse 108. Resp. 12. Dog drinking water. Pulse very irregular.

March 14. Dog not so quiet. Pulse 160, irregular.

March 15. Dog quiet. Pulse 156, more regular.

March 21. Dog walking around. Wound appears clean. Fresh dressings applied.

March 25. Edges on wound not so clear as on the twenty-first. Fresh dressing.

March 30. Dressing removed. Dog licks wound. Wound looks better.

April 5. Dog emaciated but seems to be doing fairly well.

April 10. Dog emaciated but has considerable abdominal distention.

April 12. Abdomen markedly distended. Skin clamps still in place. Dog not very active. Hemoglobin 90.

Autopsy. Dog killed with ether. Abdominal cavity contains a considerable amount of purulent fluid. Bladder markedly distended. Omentum adherent to abdominal wall along the old incision which had completely healed. Lymphatics of intestines white and stand out distinctly. Liver yellow, fatty, swollen. Spleen soft and swollen. Heart and lungs appear normal. Smears from abdominal fluid show many pus-cells, in some of which a few cocci can be found.

Dog No. 20.—March 13. Brown long-haired bitch pup, white belly. Weight 10 pounds. Pulse before starting anesthetic 168.

11.40. Anesthetic started.

11.42. Pulse 168. Resp. 60.

11.48. Abdominal incision made. Hemoglobin 85.

11.50. Pulse 200. Resp. 92.

11.55. The uterine vessels on both sides cut. Pulse 190. Resp. 80. Hemoglobin 87.

- 12.00. Morph. sulph. gr. $\frac{1}{2}$ by hypo. Pulse 188. Resp. 68.
 12.05. Pulse 144. Resp. 48. Hemoglobin 80.
 12.10. Anesthetic stopped and abdomen closed. Pulse 116.
 Resp. 40.
 12.26. (Before pressure bandage was applied.) Pulse 198.
 Resp. 69.
 12.32. (After pressure was applied.) Pulse 220. Resp. 52.
 Hemoglobin 85.
 3.00. Dog drinking water. Pulse 180. Resp. 24.
 March 14. 3.00 P. M. Pulse 128, regular. Dog quiet.
 March 15. 1 P. M. Pulse 140, regular. Dog quiet.
 March 24. Bandage taken off. Wound clean. Dog active
 and feeling good.
 April 12. Dog had been active and doing very well until two days
 ago when she refused to eat, and on April 11, at 6 P. M. she died.
Autopsy. Incision clean and perfectly united. There are a
 few adhesions between omentum and abdominal wall along the
 old wound. No free fluid and no blood in abdominal cavity.
 Peritoneal surface smooth and apparently clear. Bladder
 small. Uterine stumps free. No adhesions but tissues about
 it are somewhat blood-stained. Intestines, spleen, liver, heart,
 lungs, etc., appear normal.
 Dog No. 21.—March 21. Black and tan short-haired bitch,
 tan muzzle, white throat and four white feet. Weight 16 pounds.
 10.30. Anesthetic started. Pulse 88, very irregular.
 10.45. Pulse 160. Resp. 32. Hemoglobin 125.
 11.20. The uterine vessels on both sides cut.
 11.25. Pulse 162. Resp. 56.
 11.27. Abdomen closed.
 11.30. Light pressure bandage applied. Pulse 132–136. Resp.
 48. Hemoglobin 110.
 11.50. Pulse 126. Resp. 40.
 11.55. Pulse 128. Resp. 30. labored.
 12.00. Pulse 144, irregular.
 12.05. Pulse 172, regular in force and rhythm. Resp. 20.
 12.20. Pulse 136–156. Resp. 14.
 12.23. Morph. sulph. gr. $\frac{1}{2}$ by hypo.
 12.30. Pulse 148. More regular and better quality. Resp.
 12. Hemoglobin 110.
 March 22. 5.00 P. M. Dog quiet. Pulse 132.
 March 25. Bandage removed. Wound dressed again. In-
 cision looks clean. Doing well. Dog feeling fairly well.
 April 25. Dog has made an uninterrupted recovery. Is
 now well nourished and in very good condition.
 Dog No. 22.—March 24. Big long-haired black and white
 bitch pup. Weight 50 pounds.
 10.20. Anesthetic started.
 10.30. Pulse 144. Resp. 100.
 10.46. Incision made. Hemoglobin 115.
 10.50. Hemoglobin 115.
 11.06. The uterine vessels on both sides were cut and sutures

previously placed for closing abdominal walls were tied as soon as possible; rubber pressure bandage applied.

- 11.10. Hemoglobin 110.
 11.15. Pulse 104. Resp. 32.
 11.20. Pulse 200. Resp. 36.
 11.27. Pulse 150-152. Resp. 48
 11.35. Pulse 128-132. Resp. 24.
 11.55. Pulse 132. Resp. 24.
 12.05. Dog whining. Hemoglobin 100.
 12.15. Pulse 200+. Resp. 20.
 12.20. Morph. sulph. gr. 1 by hypo.
 March 25. Noon. Pressure bandage removed. Pulse 150 before removing pressure. Pulse 150 after removing pressure. Hemoglobin 100.
 March 26. Dog walking around.
 March 30. Dog active. Doing very well.
 April 15. Dressing removed. Hemoglobin 100.
 April 23. Hemoglobin 95.
 Dog No. 23.—April 15. Water spaniel bitch. Weight 25 pounds. Before operation pulse 160.
 10.25. Incision made. Hemoglobin 108.
 10.40. Left uterine vessels cut.
 10.45. Pulse 172. Resp. 48.
 10.47. Abdomen closed.
 10.48. Hemoglobin 95.
 10.50. Rubber pressure bandage applied.
 10.55. Pulse 156. Resp. 58.
 10.56. Hemoglobin 90.
 11.15. Pulse 114. Resp. 40. Hemoglobin 85. (?)
 11.25. Dog vomiting and whining. Pulse 180. Resp. 28.
 11.30. Morph. sulph. $\frac{1}{2}$ gr. hypo. Dog whining.
 11.35. Pulse 156. Resp. 28.
 11.45. Dog perfectly quiet. Pulse 140. Resp. 28.
 12.15. Dog perfectly quiet. Pulse 140. Resp. 20. Hemoglobin 90.
 12.30. Dog perfectly quiet. Pulse 154. Resp. 16.
 2.10. Pulse 148. Resp. 18.
 2.45. Pulse 148. Resp. 24. Hemoglobin 100. (?)
 2.55. Dog perfectly quiet.
 3.30. Dog perfectly quiet. Hemoglobin 90.
 3.40. Dog moving head some. Pulse 140. Resp. 14.
 5.00. Dog whining. Pulse 138. Resp. 12. Hemoglobin 90.
 Legs swollen, edematous, blue and cold.
 5.10. Pressure bandage removed.
 5.15. Morph. sulph. gr. $\frac{1}{2}$ by hypo.
 5.30. Pulse 140. Resp. 20. Hemoglobin 90+. Legs warm, swelling and edema have disappeared. Dog walks, but drags left leg.
 April 16. Dog walks about but seems sluggish.
 April 17. About the same as yesterday, eating and bowels moving.

- April 19. Dog still prefers to be quiet. Bandages removed.
- April 25. Dog feeling better.
- Dog No. 24.—April 20. Brown short-haired bitch, toes white-tipped. Weight 13 pounds. Pulse before starting anesthetic 164. (Pulse taken through entire experiment, at heart apex with stethoscope.)
- 10.40. Anesthetic started.
- 10.52. Incision made.
- 10.59. The uterine vessels on both sides cut. Pulse 140. Resp. 30. Hemoglobin 125.
- 11.00. Pulse 154. Resp. 80.
- 11.01. Closure finished.
- 11.02. Hemoglobin 125.
- 11.04. Abdomen compressed with hands, then two-pound weight applied until 11.00.
- 11.11. Twelve-pound weight applied to abdomen. Pulse 154. Resp. 36.
- 11.12. Dog vomited. Hemoglobin 115.
- 11.20. Pulse good volume and quality. Pulse 118. Resp. 24.
- 11.25. Pulse good volume and quality. Hemoglobin 115.
- 11.30. Pulse good volume and quality. Pulse 116. Resp. 24.
- 11.31. Twelve-pound weight removed from abdomen.
- 11.35. Abdomen reopened. Pedicles drawn up. Clot torn off of cut end of right uterine vessels in drawing up the stump, leaving a pulsating hemorrhage. A firm clot remained over cut end of left uterine vessels. This was removed and the uterine dropped back into abdomen.
- 11.42. Reclosure of abdomen started. Pulse 116. Resp. 28.
- 11.47. Pulse 124. Resp. 24.
- 11.52. Hemoglobin 107.
- 11.55. Twelve-pound weight again applied to abdomen. Pulse 132. Resp. 16.
- 11.57. Pulse better volume and quality. Pulse 114. Resp. 16.
- 12.05. Pulse 128. Resp. 20. Hemoglobin 105.
- 12.09. Twelve-pound weight removed.
- 12.10. Pulse 138. Resp. 16.
- 12.15. Morph. sulph. gr. $\frac{1}{2}$ by hypo.
- April 21. Dog walking around.
- April 23. Dressings removed.
- April 25. Doing very well.
- Dog. No. 25.—April 21. Black and white long-haired bitch pup. Weight 12 pounds. (Pulse throughout entire experiment taken at heart apex with stethoscope.)
- 11.05. Anesthetic started.
- 11.20. Pulse 200+. Resp. 120. Hemoglobin 98.
- 11.25. Hemoglobin 98.
- 11.30. Incision made.
- 11.33. The uterine vessels on both sides cut.
- 11.35. Pulse 132. Resp. 96. Hemoglobin 97.
- 11.36. Abdomen closed and four-pound weight applied.

- 11.40. Pulse 120. Resp. 62.
 11.42. Hemoglobin 88.
 11.50. Seven and one-half pounds added. Total $7\frac{1}{2}$ pounds.
 Pulse 120. Resp. 62.
 11.55. Pulse 100. Resp. 80. Hemoglobin 88.
 12.00. Dog struggling some. Pulse 120. Resp. 80.
 12.10. Pulse 120. Resp. 92. Hemoglobin 88.
 12.16. Weight removed from abdomen and morph. sulph. gr. $\frac{1}{2}$
 given by hypo.
 12.20. Pulse 120. Resp. 80.
 12.35. Pulse 86. Resp. 140. (?)
 2.30. Dog quiet. Pulse 88. Resp. 14.
 April 22. Dog walking around.
 April 25. Dog doing very well.
 Dog No. 26.—April 22. Brown long-haired skye terrier bitch
 pup. Weight $13\frac{1}{2}$ pounds. Before starting operation pulse
 160.
 10.20. Anesthetic started. Pulse taken with stethoscope at
 heart apex.
 10.40. Pulse 218. Resp. 80. Hemoglobin 100.
 10.50. Pulse 196. Resp. 112.
 10.57. Morph. sulph. gr. $\frac{1}{4}$ hypo.
 11.00. Incision made.
 11.05. Pulse 160. Resp. 100. Hemoglobin 100.
 11.09. Distended bladder tapped.
 11.15. The uterine vessels on both sides cut. Pulse 152.
 Resp. 108.
 11.18. Abdomen closed.
 11.20. Pulse 140. Resp. 112. Hemoglobin 100.
 11.21. Three and three-fourths-pound weight placed on abdo-
 men.
 11.22. Resp. 86.
 11.27. Hemoglobin 95.
 11.30. Pulse 120. Resp. 80, jerky.
 11.35. Pulse 120. Resp. 86. Hemoglobin 95.
 11.39. Four and three-fourths pounds added (total $8\frac{1}{4}$ pounds
 on abdomen).
 11.42. Weight on abdomen increased to $10\frac{1}{4}$ pounds.
 11.45. Hemoglobin 95.
 11.50. Pulse 100. Resp. 76. Hemoglobin 95.
 11.51. All weights removed.
 11.56. Pulse 120. Resp. 80. Hemoglobin 95.
 12.00. Pulse 120. Good quality. Resp. 68.
 12.08. Ten and one-fourth-pound weight again applied to
 abdomen. Pulse good.
 12.16. Pulse 132. Resp. 60.
 12.21. Pulse 120. Resp. 44.
 12.34. Morph. sulph. gr. $\frac{1}{4}$ by hypo. Pulse 120. Resp. 44.
 All weights removed.
 April 23. Dog walking around. Condition good.
 April 25. Condition good.

Dog No. 27.—April 24. This is the dog used as Dog No. 9. Weight 21 pounds. (Pulse taken with stethoscope at heart apex.)

- 10.25. Anesthetic started.
- 10.30. Pulse 140. Resp. 48.
- 10.40. Hemoglobin 100. (?)
- 10.45. Abdominal incision.
- 10.49. Top of uterus and lower portion of both oviducts excised.
- 10.50. Pulse 132. Resp. 56. Hemoglobin 110.
- 10.52. Abdominal closure finished and 5 pound weight applied.
- Pulse 120. Resp. 52.
- 10.57. Pulse 148. Resp. 44. Hemoglobin 109.
- 11.03. Pulse 176. Resp. 50. Hemoglobin 103.
- 11.10. Pulse 176. Resp. 48. Hemoglobin 103.
- 11.20. Morph. sulph. gr. $\frac{1}{4}$ by hypo.
- 11.25. Four-pound weight added. (total 9 pounds). Pulse 180. Resp. 48.
- 11.35. Pulse 160. Resp. 36. Hemoglobin 98.
- 11.40. Pulse 160. Resp. 40. Hemoglobin 103.
- 11.45. Morph. sulph. gr. $\frac{1}{4}$ hypo. Pulse 160. Resp. 36.
- 11.50. Pulse 176. Resp. 32.
- 12.00. Pulse 192. Resp. 32.
- 12.10. Pulse 192. Resp. 36.
- 12.15. All weights removed. Pulse 168. Resp. 36. Pulse irregular.
- 12.20. Pulse 160. Resp. 36.
- 12.30. Pulse 156. Resp. 36.
- 6.00. Dog lies quietly looking around.
- April 25. Dog walks around barking.

Résumé.—I wish to call attention to one or two striking experiments in this series.

Dog No. 19. Weight of dog, 8 pounds. The pulse immediately after both uterine arteries and veins had been cut and before a tight abdominal bandage had been applied, was 200, and the respirations were 48. Forty-five minutes later the pulse was 96 and the respirations were 24. Four hours and ten minutes after the cutting of the uterine vessels, the pulse was 108 and the respirations were 12.

In dog No. 21, the hemoglobin, which before the cutting of the vessels was 125, fell to 110 in 10 minutes. The bandage was then applied to the abdomen and the pulse from 162 and the respirations from 56 came down to 126 and 40 respectively in 20 minutes. Fifty minutes later the pulse varied between 156 and 136, and the respirations between 14 and 20, the hemoglobin still remaining at 110. In two similar experiments a rubber tourni-

quet was applied after cutting the vessels, and the results were somewhat similar.

In dogs Nos. 17, 18, 20, still more striking results in the pulse, respiration and hemoglobin were obtained by applying weights to the lower abdomen and thus bringing the anterior in more direct apposition with the posterior abdominal wall.

Thus in dog No. 17, which weighed 13 pounds, 12 minutes after cutting the uterine vessels the pulse was 154, the respirations were 36, and the hemoglobin had fallen 10 points. A 12-pound weight was applied to the abdomen and in 8 minutes the pulse had fallen to 118, and the respirations to 24, but the hemoglobin remained stationary. After 10 minutes the pulse was 116 and the respirations were 24. We now opened the abdomen and exposed the vessels; they were surrounded by a firm clot. The clot was removed and the pedicles were dropped back into the abdomen. The pulse and respirations rose again, and the hemoglobin fell to 107-8 points lower than it was before the fresh hemorrhage was started up. The weight was applied again to the abdomen and in 2 minutes the pulse had fallen from 132 to 114. Twelve minutes later the weight was removed again, and immediately the pulse rose to 148.

One other striking experiment in a dog that weighed 12 pounds in this group showed that in 5 minutes after putting a $7\frac{1}{2}$ -pound weight on the abdomen, the pulse had fallen from 120 to 100, and the hemoglobin from 98 to 88. This and other experiments with pressure, particularly when it is applied so that the anterior and posterior abdominal walls are brought more closely together, would suggest the application of pressure over the lower abdomen in cases of hemorrhage from a ruptured ectopic pregnancy. This might possibly be carried out by the use of shot or sand bags of known weight, as much weight being employed as the patient could comfortably stand. As our experiments showed, by using the weight in the way just described the results were more striking than when the abdomen was simply bandaged.

Series No. 6.—Division of Uterine Vessels with Dog in the Perpendicular Position; Observations upon Pulse, Respiration and Hemoglobin.

Dog. No. 28.—April 27. Same dog as used April 15 as dog No. 16.

Weight 24 pounds. Pulse before starting anesthetic 148.

10.20. Anesthetic started.

10.32. Pulse 148. Resp. 68. Hemoglobin 75.

10.35. Hemoglobin 75.

10.38. Incision made. On opening peritoneal cavity no fluid present. A few adhesions between the intestines; posterior portion of the bladder adherent to the uterus. At this point a markedly organized blood-clot. The left uterine vessels thoroughly thrombosed.

10.52. The uterine vessels on both sides cut.

10.54. Ether anesthesia stopped. Morph. sulph. gr. $\frac{1}{2}$ hypo. given and foot of table elevated $2\frac{1}{2}$ feet.

10.56. Foot of table raised to perpendicular position.

11.00. Pulse 200. Resp. 28. Hemoglobin 65.

11.06. Pulse 180. Resp. 28. Hemoglobin 65.

11.12. Hemoglobin 62.

11.16. Pulse 140. Resp. 24. Hemoglobin 61.

11.18. Hemoglobin 61.

11.25. Pulse 160. Resp. 28. Hemoglobin 62.

11.36. Pulse 160. Resp. 28.

11.45. On reopening the peritoneal cavity a well-marked clot seen near bladder and incised uterine vessels. No bleeding at this point. On pulling the tissue and clot forward and separating them the oozing began from the left uterine vessels. The pelvic cavity was free from blood. On making pressure on the upper abdomen bloody fluid came out of incision which had been prolonged up toward head for $2\frac{1}{2}$ to 3 inches. Clot removed from left vessels. Right vessels not disturbed. Three minutes after removing clot from left uterine vessels hemoglobin 55 per cent.

12.30. Table lowered to horizontal position. Pulse 200. Resp. 44.

12.32. Hemoglobin 54.

6.00. P. M. Dog drinking water.

April 28. Dog found dead this morning. On opening the abdomen the intestines are found surrounded by clotted blood. Blood-clots found above and below the liver and throughout the cavity. No new formed adhesions found. Both uterine vessels cut ends covered with blood-clots. Intestines, liver, spleen, heart, lungs, etc., appear normal. Bladder small and walls rather firm.

Dog. No. 29.—April 28. Same dog as that used for No. 13.

Weight $23\frac{1}{2}$ pounds. Before starting anesthetic pulse 72.

11.40. Pulse 200. Resp. 44.

11.50. Morph. sulph. gr. $\frac{1}{2}$ by hypo. Ether discontinued.

11.52. Pulse 200+. Resp. 24. Hemoglobin 100.

11.54. Incision made with table in perpendicular position; head down. Bladder found adherent to broad ligament near site of formerly incised vessel. Peritoneum, oviducts and body of uterus pale. Thrombosis in both uterine arteries well organized. Dog whining.

11.58. Both uterine vessels cut. Dog whining less than before vessels were cut.

12.00. Dog vomited. Straining and whining.

12.07. Morph. sulph. gr. $\frac{1}{4}$ by hypo. Hemoglobin 97.

12.10. Morph. sulph. gr. $\frac{1}{4}$ by hypo.

12.10. Blood-clot at seat of incision glazed over and vessel pulsates through partially clotted blood. Dog struggling markedly forcing blood and omentum out through the incision.

12.15. Ether given in mask and morph. sulph. gr. $\frac{1}{4}$ hypo.

12.30. Closure.

12.50. Morph. sulph. gr. $\frac{1}{4}$ by hypo. Pulse 168. Resp. 20. Hemoglobin 92.

1.30. Pulse irregular, Pulse 132. Resp. 16.

5.00. Dog awake, looking around.

April 29. Dog active.

May 2. Dressing removed. Wound doing well. Dog active and playful.

Résumé.—In the first dog the pulse had fallen from 200 to 180 ten minutes after the dog had been placed in the upright position, but the hemoglobin remained stationary. After twenty minutes the pulse had fallen to 140 and the hemoglobin had also dropped 4 points. In twenty minutes more the pulse had risen to 160, but the hemoglobin remained practically stationary. The abdominal cavity was reopened and a well-defined clot was seen covering the incised tissues; the vessel had ceased to bleed.

In the second dog the vessels were cut with the dog in the perpendicular position, and the bleeding vessel was observed through a strong magnifying glass in order to compare the time of clotting with the hemoglobin readings. The hemoglobin had fallen 3 points seven minutes after intision of the vessels. After 3 minutes more the incised tissues had begun to take on a glazed appearance, and the hemoglobin remained stationary (ten minutes after the uterine vessels had been cut). Three minutes later the dog began to struggle and to force the abdominal contents through the incision, and the hemoglobin taken 40 minutes later showed a fall of 5 points more. One hour and twenty minutes later the pulse was 132, the respirations were 16 (the hemoglobin was not taken). In this experiment we would have to consider the influence that the air would have in helping to cause the clotting of the blood, and as a consequence the slight drop in the hemoglobin index.

CONCLUSIONS.

From these experiments which now number 31 we feel justified more and more in believing that the intra-abdominal hemorrhage, such as is met with in women suffering from collapse after the rupture of an ectopic gestation, is not sufficient in itself to cause a fatal termination in these cases. Death is caused mainly

by shock which may be increased by various procedures. The hemorrhage *per se* is rarely, if ever, the sole cause of death.

One experiment goes to show that the superadded shock belonging to immediate operation is likely to be very dangerous.

It will doubtless be maintained by some that our experimental work has shown nothing more than that the dog can withstand a greater loss of blood than a woman—a recognized fact. And yet it seems fair to assume, as will be seen on consulting our protocols, that in many of our experiments, we made the tests sufficiently severe to more than equalize the factor of resistance to the loss of blood in the dog as compared with that of the human being under fairly similar conditions. In other words, taking into consideration this difference in resistance, by cutting both uterine arteries and veins and in some instances both ovarian arteries and veins as well, we subjected our dogs to a risk of bleeding to death as great as or greater than that incurred by the average woman suffering from a ruptured tubal pregnancy.

Our experiments further show that the clotting probably occurs within 15 to 20 minutes after the vessels have been incised, and that the time of clotting can be known by observing the hemoglobin index. The subcutaneous injection of normal salt solution in all probability does not cause a renewal of the hemorrhage. But manipulation of the tissues by disturbing the clot causes the bleeding to start up again, and may thus be mistaken for a continuing hemorrhage.

Our experiments also show that by the use of bandages, but more particularly by the application of more or less weight to the lower abdomen, the pulse is rendered slower and of better quality, and that the hemoglobin is kept up.

It gives me great pleasure to acknowledge the valuable assistance given me in the carrying out of these experiments by my former assistant Dr. M. B. Bonta, and by my present assistants Drs. Frank C. Ainley and Fred W. Hall.

SOME COMMENTS ON DR. REYNOLDS' PAPER.
 "THE SUPERIORITY OF PRIMARY OVER SECONDARY SECTION."

BY

STANLEY P. WARREN, M. D.,

Portland, Maine.

Obstetrician to the Maine General Hospital.

ONE of the most forcible papers on Obstetrics in recent years was read by Dr. Reynolds, of Boston, at the 1907 meeting of the American Gynecological Society, with the title "The Superiority of Primary over Secondary Cesarean Sections, and the Feasibility and Advantages of a Predetermination of the Method of Delivery." It is a very able presentation of his well-known views in favor of delivery by an elective abdominal section rather than by a difficult intrapelvic operation either at term or premature. The paper is the result of an immense amount of study both of clinical material and case reports, and written with the elegant style and clearness for which its distinguished author is noted. Its professional standard will be seen from a single paragraph: "It may be objected to most of what I have said in this paper that such a practise is beyond the powers of the general practitioner. I would respond," it is undoubtedly so. "This is not the work for inexperienced men. It must always belong to those who are really obstetrical experts, and it is for them to bring about the conditions which permit such work." Taken as a whole, the position is in line with the recent views of leading obstetricians, as the main question has been influenced by modern abdominal surgery, by an improved knowledge of pelvic dynamics, and by a better grasp of the mechanism of labor.

The argument is based on a statistical table, prepared from the literature of the world special to the subject, of all "case reports of Sanger Cesarean sections done within the last ten years by operators who had at least five cases." From these reports "were eliminated all cases in which section had been performed for placenta previa, eclampsia, carcinoma or other new-growths," and "all cases complicated by other operations having a mortality of their own." The cases finally selected were divided for the purpose of his study into three classes: "(1) Primary sections: those performed before the beginning of labor, or with the advent of the first pains. (2) Secondary sections: those performed after a certain amount of labor had demonstrated its

probable unsatisfactory character, but before exhaustion had set in, and before it had become definitely established that the natural powers would fail to effect the passage of the brim. (3) Late sections: those performed after definite arrest of the head at the brim."

Two hundred and eighty-nine cases by twenty different operators were retained for analysis. Of these, eighty-two were operated upon before labor began, with one death, a mortality of 1 to 2 per cent.; there were 158 cases operated upon early in labor with six deaths, a mortality of 3.8 per cent., and there were 49 cases operated upon after arrest of the head or after an unduly long first stage, with six deaths, a mortality of 12 per cent. From these results Reynolds argues that "when the section is performed for purely mechanical indications, its mortality is proportionate to the amount of labor which has been endured before operation." Agreeing as I do with the truth of this statement, I wish that the question of the degree of morbidity might have been included with that of mortality, since I am sure that the contention might be strengthened thereby. While of much less importance, yet there certainly is a relative increase of morbidity, as well as mortality, dependent upon the amount of vaginal examination and instrumental work done before section is decided. Of the reality of this I am convinced by personal experience, which though slight in numerical comparison with that of others, yet has its value.

Of the five cases of Cesarean section which I have made since July, 1906, including another which also I should have done except for peculiar reasons, all but the last were successful for mother and child. The first and second were elective at the thirty-eighth week. Neither of these women had any vaginal examination within a week before operation. The first section was made at the patient's home in a tenement, and the second at the Maine General Hospital. There was nothing in the convalescence of either of these two women different from that of an ordinary labor, except the intestinal torpor common after abdominal operations. The third section was made at a Boston hospital where, during the night preceding the appointed day of operation, labor began unexpectedly. Section was made the following morning, and so far as I can learn the puerperium was uneventful. In the fourth case labor began at term in the morning. The attending physician, when called late that afternoon, found the head in the lower strait, but the pelvic outlet was nearly closed by a bony growth upon the

right pubic ramus. My examination confirming his own, the woman was taken to the hospital and I made section at once. Aside from the usual torpor of the intestines the convalescence was absolute y uneventful. My fifth patient had a history of five hard deliveries, the last three ending in the extraction of large children, all either still-born or living but a few hours. In the sixth labor at term the physician recognized the pelvic deform ty, a generally contracted pelvis, and made only a brief trial of forceps. A tentative use of the Tarnier by myself convinced us both that delivery through the vagina was impossible. She was taken in an ambulance to the hospital, and I made an immediate section. Owing to the repeated vaginal examinations and the forceps slight abrasions of the canal had been made and there was a mild grade of sepsis during the first week after operation, the temperature ranging from 101° to 103° , accompanied with considerable paresis of the intestines. There was quite an amount of intestinal toxemia also, due, undoubtedly, to the fecal stagnation which is so common among the lower class of pregnant women, but the whole disturbance ended after free catharsis. The sixth patient was a young primipara who weighed two hundred pounds. Last menstruation, October 25, 1907. Labor began August 10 and continued intermittently until the 13th. Natural delivery being evidently impossible, forceps were tried and failed. At the hospital, examination under ether showed a narrow, tense vagina, a conjugata vera of three and one-quarter inches, no engagement, a cephalic presentation in O. R. P. position, and the uterus closely contracted upon a large child, with the cord pulseless. Forceps and version were rejected without hesitation. Perforation of the head was impossible owing to its stony hardness, no sutures nor fontanelles being recognizable. Pubiotomy was considered and rejected, owing to the extreme size of the child. I then made a classical section, which was unusually difficult because of the thickness of abdominal fat. The child was dead *in utero*, and weighed, when extracted, eleven and one-quarter pounds. The patient's temperature was 103° at the end of the operation, and though it gradually fell to normal in forty-eight hours, she died on the third day of sepsis and exhaustion.

So far as such a limited number of cases is valuable, they seem to corroborate the idea of Reynolds in this paper, that the rate of mortality, and as I suggest of morbidity also, depends upon the amount of manipulation of the canal before the section.

Whatever inference one may draw from my own cases of section upon this point, it seems to me that his statistics, above referred to, argue strongly in favor of an elective rather than a compulsory section.

A second interesting proposition in his paper is the following: "Success in predicting the result of natural labor to be expected in a given case is dependent upon a capacity for estimating in advance each of the three great factors in labor; *i.e.*, the obstacle offered by the pelvis, the amount of the maternal muscular power, and the characteristics of the head." In elaborating the proposition the fact is emphasized, that "the amount of the pelvic obstacle is too often spoken of as though it were a mere matter of size obtainable by measurements; in reality the amount of the pelvic obstacle is much more a question of its shape, or rather the influence of its shape, upon the diminution of its size." This statement is certainly true here in Maine, where the average size of children, relative to those born elsewhere in this country, is decidedly large. Some years ago I found by referring to my record of deliveries that of five hundred children the average weight of males was eight and three-quarters pounds and of females, eight and one-quarter pounds. A second five hundred maintained the same average, and I think that a third five hundred would do the same, though I have not as yet classified them. Children weighing nine and ten pounds at birth are quite frequent in this locality, and I have records of those weighing up to sixteen pounds, the two of the latter weight, however, being stillborn because of the difficulty in delivering them. I should judge that the greater proportion of those weighing ten pounds or more required instrumental delivery, but still a certain number of our women have spontaneous delivery of even these large children. I regret that I cannot speak so confidently of the size of the pelvis of these mothers, but so far as I have records they do not average larger than the classic measurements. It is evident from these figures that the pelvis may be of normal dimensions, and yet in these cases of massive children, or in the so-called "pendulous abdomen" cases, where the inclination of the brim is almost horizontal, delivery may require some formidable operation. I have noticed that the unsymmetrical pelvis of those women who have had tuberculosis of the head of the femur in childhood, has several times required a tremendous effort with forceps. Other illustrations might be cited of the fact that

pelvic shape is nearly as important a factor as pelvic size in determining delivery.

The third proposition in Reynold's paper, which seems to me to be noticeable, is that "the character of labor can be predicted from the character of the pregnancy," and further on the author says that he has "now become convinced that in well-marked cases it is a safe guide in practice." The more I study the proposition the less do I understand it, and from personal experience I am disposed to disagree with it. It depends largely upon the latitude intended to be given to the phrase "in well-marked cases." In certain evident conditions, such as when the pregnant woman has grave organic disease, like phthisis, valvular disease, chronic nephritis, grave toxemia, etc., or is evidently of feeble musculature, a neurasthenic or petted society butterfly, the character of the given labor may be fairly assumed. But considering the large class of women for whom gestation is uneventful and without professional interest, it seems to me that such a statement is too sweeping. I have been in the habit of late years of keeping a professional oversight of my pregnant women throughout the period, and I am sure that many of those who have given me the least anxiety up to labor have caused me the greatest anxiety at labor. Did space permit, I think that I could bring satisfactory clinical proof of my opinion.

The following recent cases may be instanced: Two young American women had an absolutely uneventful pregnancy, were in excellent health throughout it, all functions of the body were as normal as before conception, and both laid on flesh. Each had frequent urinalyses. Both were of small stature; one had a just minor pelvis, as decided antepartum, while in the other the pelvis was thought to be ample, because the external diameters were all normal and it was impossible to touch the promontory by the finger in vaginal examination. If the character of the labor may be predicted from the character of the pregnancy, both of these women should have had a featureless delivery. As a matter of fact, each had an O. L. P. presentation, and were delivered by long; hard traction with the Tarnier. The first woman had a true conjugate of $3\frac{1}{2}$ inches, by careful measurement after delivery while still under ether, and there was a complete laceration of the perineum, the tear extending more than an inch up the rectum. The child weighed $8\frac{3}{4}$ pounds, was deeply asphyxiated, and was saved by an hour's steady work, though it had convulsions during the second day. In

the second woman the head was arrested at the brim, was rotated forward by the forceps, and delivered after more than an hour's work. This child weighed $8\frac{1}{2}$ pounds, but unfortunately could not be resuscitated. A third patient is a healthy, hard-working housewife, of spare, medium figure, whose pregnancies are physiological and usually announced by quickening. All her labors are at term. With the first child the cervix required manual dilatation after the end of forty-eight hours of strong pains. Delivery was effected by myself and assistant after two hours' work with forceps, accompanied with one of the most extensive tears of the pelvic floor that it has ever been my lot to cause. The child weighed eight pounds, and was saved by methodical persistence for a long time, but had facial and arm paralysis for several weeks. Her second child I delivered with the Tarnier after thirty-six hours of pains, weighed eleven pounds, and was saved. During the third pregnancy she was carefully dieted according to the plan of Prochovnic with the hope that the child might be small. Delivery, at term, was by as difficult an extraction with the Tarnier as I ever remember, the child weighed eleven and one-quarter pounds naked, and could not be revived. It was a mistake not to have made a section. In none of my Cesarean sections, referred to above, was there anything in the subjective conditions of pregnancy to indicate a difficult labor, each of the women, so far as I know, having no constitutional disturbance other than perhaps the early nausea and vomiting. You may say that these cases are exceptional and too few in number to affect the truth of Reynolds' proposition. I am sure that my note-book would show many similar clinical histories, and from personal experience I must dissent, therefore, from his statement, that the character of the pregnancy is a safe guide to the character of the labor. I wait for further explanation of the proposition from the author.

There is general agreement with Reynolds that the third factor in the result of labor is the size and ossification of the head. Cephalic measurement *in utero* is very uncertain, though the expert ordinarily can make a fair guess at the size of the body of the fetus by palpation of the uterine ovoid, and by noting the readiness with which the head can be pushed into the brim. Various elements, however, may unite in lessening the value of these manipulations; a nervous patient, rigid parietes, excessive fat or liquor amnii are some of the factors that interfere with their reliability. I have never been enthusiastic over

the Müller method of estimating the size of the head. It is too painful for the average woman to be worth much as a gauge for incompetency of the inlet, and with the woman anesthetized even Williams is careful to guard himself (in his section on "Methods of Determining the Size of the Head" (OBSTETRICS, p. 629) by the words, "in some instances" ("again, in some instances, Müller's method of impression may afford material aid"). In primiparæ with lax, thin abdominal parietes it is possible by palpation of the uterine body to obtain a fairly trustworthy estimate of the bulk of the fetus, and under such favorable conditions even the general practitioner can prepare himself for the problem of successful delivery in doubtful pelvis. In primiparæ, the crucial test of a former difficult operative delivery, a test which is so valuable a diagnostic guide in multiparæ, is wanting. Under such uncertainties of fetal size and pelvic capability custom (or if you please, ignorance) has fixed the routine of forceps and traction for primiparæ, where there is a reasonable chance for disproportion between the passage and passenger. Under similar conditions there is good authority for delaying operative interference, until the natural powers, and perhaps some tentative intrapelvic operation, has shown the amount of disability. If these result unfavorably then it may be considered as probable that the pelvis is too small for the birth of subsequent living children. For Reynolds well says: "it may certainly be laid down as a safe rule that when an intrapelvic operation, necessitated by alteration of the pelvic shape and diameters, has been so difficult as to yield a still-born child at the hands of an experienced accoucheur, subsequent intrapelvic deliveries in the same woman are sure to be highly dangerous to the child, and are likely to be less favorable to the mother than the primary Cesarean section with its exceedingly low mortality and absence of subsequent morbidity."

To me the most suggestive thought in the whole of this most interesting paper lies in its closing paragraphs which I beg to reproduce in full. "Once we can teach the mass of the profession that real success in the management of difficult cases is only to be attained by foreseeing their difficulty, and that it is possible for sufficiently experienced men to select these cases during pregnancy; once we can teach them that in such cases the ordinary, reckless, and careless habit of trusting to nature, *i. e.*, to blind luck, in labor, and of sending for a specialist only after the mischief is done, merely leads to ill-health of the mother

and death to the baby; we shall find all the better class of general practitioners willing and glad to consult beforehand men who have special knowledge, and who do not attend normal labor."

"If this proves to be the future of obstetrics it cannot be doubted that obstetricians who are not at everyone's beck and call for normal labor, but who find their practice in the management of really difficult cases alone will be in a far more enviable position than that occupied by most obstetrical experts to-day."

I am fully in agreement with Fry of Washington (Management of Labor in Minor Degrees of Pelvic Contraction, *American Journal of Medical Sciences*, May, 1908), that deformities of the pelvis, absolute in fractions of inches or centimeters or relative as incompetent for large children, are much more frequent than is ordinarily accepted. It is not to be expected that the general practitioner will spend much study over fractional differences in pelvic diameters. The refinements of pelvimetry and facility in the use of complicated pelvic calibrators are for the expert. From a fairly extensive acquaintance with the obstetrical work of the general practitioner I am convinced that most of the mishaps of delivery are due not so much to simple pelvic insufficiency as to failure to recognize, before operation, malpositions of the presentation or that the child is too large for even a normal pelvis. The conscientious practitioner will remedy either of these two mistakes by careful study of conditions and environment; the other man will never rise to the level of Science or Art, and will always be content with brute force.

159 HIGH STREET.

REPORT OF FOURTEEN CASES OF CESAREAN SECTION.

BY

JOHN OSBORN POLAK, M. S. M. D.,

Professor of Obstetrics, Dartmouth Medical College; Professor of Obstetrics and Gynecology, Brooklyn Postgraduate Medical School; Adjunct Professor of Obstetrics and Gynecology, Long Island College Hospital; Obstetrician to Methodist Episcopal Hospital, etc.

MODERN Cesarean section during the last decade has had a constantly growing field in obstetric surgery. Perfected technique and timely intervention have lowered the maternal mortality, and there has been on the part of the profession an ever-increasing disposition against the sacrificial procedures on the child; consequently, to-day, with its widened relative indications, the operation may be put in contrast with some of the intrapelvic methods of delivery, and elected because of its advantages to the mother and child.

Nine of these operations were performed for varying degrees of contracted pelvis. No case of absolute contraction occurred in this series; though Case XI presented such a high degree of kyphotic deformity that the indication was absolute. The remaining eight belong to that large majority of border-line cases which tax the experience and skill of the obstetric surgeon. Three of these operations were for dystocia, resulting from ventrofixation of the uterus. The original procedure in each instance having been a deliberate fixation for descendens uteri. Two patients were subjected to section for dystocia, consequent upon the incarceration of a tumor within the pelvic basin which obstructed the descent of the presenting head, and made delivery via vagina a mechanical impossibility. In Case II the obstructing tumor was a cervical myoma, while in Case VI a suppurating dermoid prevented the head from entering the pelvis.

The results in this series bear out the contentions of Reynolds; *i.e.*, that primary section is the ideal procedure and is practically free from danger. That the morbidity, as well as the mortality, is proportionate to the amount of labor which has been endured before the operation. The technic employed differs somewhat from that of the classical section by foreign operators. The abdominal incision was made an inch to the right of the median line, taking the umbilicus as its centre point, and never extending more than three inches below the navel. When the peritoneum was opened, the intestines were pushed aside and the uterus lifted up by an assistant and held firmly against the abdominal wound, but not eventrated through it, by pressure on the outside of the abdomen, from behind forward. With the anterior uterine wall thus exposed through the abdominal wound, a longitudinal incision, 5 to 6 inches in length, was made through the anterior and fundal surface of the thickened upper segment. An incision in this location secures the best hemostasis. In Case I the uterine incision was extended low enough to reach the bladder attachment, and this, I think, was due to the high position of the retraction ring, and the excessive thinning of the lower segment.

In Cases IV and V the firm attachment of the anterior and fundal face of the uterus to the abdominal wall, following the fixation operation, necessitated an incision in the posterior surface of the organ. Case XIV which was also one in which a ventrofixation had been done, presented a uterus divided by a wide ligamentous band, into a large and excessively thinned

compartment, containing the fetal body, placenta and liquor amnii to the right, and a small inferior compartment containing the head on the left. The development was like that of a right uterus unicornis. The incision here was begun just in front of the right tubal origin, and extended obliquely downward, this being the only site free of adhesions.

The assistant eventrated the uterus through the abdominal incision as the child was withdrawn in all of these operations, except in Case XIV (too extensive adhesions preventing this step), and moist gauze rolls were so placed as to hold back the intestines, thus permitting us to work through a short abdominal incision, minimizing the trauma, the handling of the intestines, and the danger of subsequent hernia so apt to follow the long incision.

Only in Case I was a tourniquet used to control the hemorrhage. In the last thirteen digital compression of the broad ligaments was made by the assistant after the uterus was eventrated. A continuous saline irrigation at 115 degrees was employed during the suture of the uterus.

The method of uterine suture is worthy of mention; *i.e.*, the two sides of the uterine incision were held by an assistant, parallel and everted, and long, straight Keith needles, armed with No. 2, 20 day chromic gut were passed at half-inch intervals through both sides at once, including the peritoneum and muscle, but skipping the mucosa. These were tied from above downward and buried by a fold of peritoneum, brought over the line of the incision with a continuous catgut suture. Three pregnancies have followed in two of these women. The uterine development and spontaneous delivery after induced labors have occurred without incident.

A gauze drain was used twice; in both instances it was necessary to tampon the uterus for hemorrhage before the sutures were tied. An end of the gauze packing was carried through the cervix into the vagina and withdrawn within twelve hours. The pelvis was always mopped dry, and the omentum brought down over the intestines and placed behind the uterus before the abdomen was closed.

Chloroform-oxygen, given with an open Esmarek mask, through which the tube from an oxygen tank was run, has proved the most satisfactory anesthetic. Since using this combination we have never noticed anesthesia of the fetus, so frequently met when ether was used. The narcosis was com-

menced, just as the final cleansing of the abdomen was begun. Thirty minims of ergotole was given just as the anesthetic was started, and a second hypodermic injected when the suture of the uterus was completed. The smoothness of the convalescence has borne a direct relation to the time the woman was in labor, stormy when the patient was operated during the second stage.

CASE I.—Mrs. M. G., aged 24, a primipara. Seen in consultation February 19, 1902. Had been in labor twenty hours. Membranes ruptured, cervix well dilated. Head presenting at the brim as a brow, unengaged. Dorsum and occiput to the left and posterior. External measurements: Iliosacral, 10 inches, or 25 cm.; ilio-cristal, 10 inches, or 25 cm.; external conjugate, 7 inches, or 18 cm. Condition of woman and child good.

The retraction ring was well marked, five inches above the pubis. The patient was removed to the Williamsburgh Hospital, and prepared for section. Under anesthesia, an attempt was made to flex and engage the head by tentative traction with axis-traction forceps while the woman was in the Walcher position. This attempt failing and the condition of the uterus contraindicating version, a Cesarean section was made through a five-inch abdominal incision, the uterus was incised longitudinally, and a ten-pound three-ounce living child delivered. The uterine wound was closed with interrupted chromicized catgut sutures, which were buried by a running peritoneal suture of plain catgut. The abdominal wound was closed in tiers. The recovery of both mother and child was uneventful. This patient was subsequently delivered by me, by podalic version, two years later, of a seven-pound girl.

CASE II.—Mrs. S., aged 39, seven children, all difficult labors, last nine years ago by craniotomy, was seen in consultation March, 1904. The patient had been in labor for twelve hours. The membranes were unruptured and the general condition good. Abdominal examination showed a cephalic presentation, dorsum to the left, and a fetal heart of 140. On vaginal examination a large cervical fibroid was found incarcerated in the pelvis, which completely obstructed the vagina, making it impossible to palpate the cervix. With the patient under anesthesia and placed in the knee-chest position, an attempt was made to dislodge the tumor manually, this failing, a Cesaro-hysterectomy was done, with recovery to both mother and child.

CASE III.—Mrs. H., aged 24, referred to me by the late Dr. Wm. C. Schmidt. The patient had fallen out of a carriage when an infant of sixteen months. This fall was followed by disease of left hip joint with resulting ankylosis. Since then she has been fairly well and was married one year previous to my seeing her, having become pregnant in the interim. She presented the following measurements: Intersacral, 9 inches; intercristal, $9\frac{1}{4}$ inches; right external oblique, $8\frac{1}{2}$ inches; left external oblique, $7\frac{1}{2}$ inches; external conjugate, $6\frac{3}{4}$ inches. The pubic arch was

very narrow, the pelvis generally contracted and obliquely shaped. Induction at the thirty-second week or elective Cesarean was advised. The patient elected latter. A primary section was done February, 1904, delivering a living child, with uninterrupted recovery to the mother. At the request of the family, the patient was sterilized by the removal of the tubes.

CASE IV.—Mrs. H. C., aged 33, married, two children, both difficult births. Prolapse of the uterus followed her last accouchement, for the cure of which she was operated by a general surgeon three years before. The cervix was amputated, the anterior and vaginal wall repaired and the uterus fixed by three through-and-through silk-worm-gut sutures, which were left in place for three weeks. The anatomical result of the operation was good. She became pregnant in February, 1904, and suffered constant pain in, and dragging on the abdominal scar from the fourth month of gestation. She was seen by me in November, 1904. The abdomen was pendulous, the child was lying in a left scapular anterior position. Two days later she fell into labor, and I advised her physician to wait for dilatation before deciding on the mode of delivery. At the end of ten hours of inefficient pains, the cervix was the size of a silver dollar, but could only be reached by passing the whole hand into the vagina. The anterior wall of the uterus from the point of the abdominal fixation to the anterior lip of the cervix formed a thick shelf, blocking the pelvis and making it impossible for the head to descend. Several attempts were made to enter the uterus via the cervix, but its high posterior position and the unyieldingness of the anterior shelf made a delivery impossible via this channel. Cesarean was decided on and done, the abdomen was incised above and to the right of the umbilicus, and the uterus found firmly adherent to the old scar throughout its entire length. The entire distension of the uterus was of the posterior wall, which was excessively thinned. The uterine incision was made in the median line, posterior to the fundus, and a living child extracted. An iodoform gauze pack was necessary to control the hemorrhage and retract the uterus, an end was run through cervix. The uterine wound was closed with interrupted sutures, buried by a Lambert of the peritoneum and the abdomen, in the usual manner. The recovery was more or less stormy for the first week.

CASE V.—Mrs. D., aged 35, married one year. Had always been delicate. Since puberty she had suffered from comenstrual and intermenstrual pain in back and left side. In 1895, in the Flower Hospital, the left ovary was removed and the uterus *suspended*. Extensive wound suppuration followed this operation. Since she has been well until marriage, when she became pregnant and developed a mild toxemia during the early months, evidenced by hyperemesis. She entered my service at the Methodist Episcopal Hospital, March 1, 1907. At this time she was in the thirty sixth week of her pregnancy. The pelvic measurements were normal, there was

albumin and a few hyalin casts in the urine. The child was lying transversely with the head to the left. The uterine wall appeared particularly thin and failed to contract with any vigor under stimulation. She was put to bed and placed on a restricted diet, which treatment improved her kidney condition. On March 29 she started in labor; the pains were irregular, and inefficient during the night, and no progress in dilatation was made. On examination, the vagina was found to be drawn up in longitudinal folds, and the cervix located $6\frac{3}{4}$ inches from the vulvo-vaginal orifice, pointing backward and upward toward and on level of the fourth lumbar vertebra. Here again, as in the former case, the anterior uterine wall, from the point of the abdominal fixation was markedly thickened, and formed a distinct shelf across the pelvis. After eighteen hours of labor with no gain, it was decided to make a Cesarean section, which was done on the afternoon of March 30, through a $4\frac{1}{2}$ -inch abdominal incision and a longitudinal incision through the posterior fundal wall of the uterus, a living child, weighing $6\frac{7}{8}$ pounds, was delivered. Considerable difficulty was experienced in getting the uterus to contract and retract, as the posterior wall remained as a distended flaccid pouch after the sutures were introduced. Finally, under ergot, manipulation and an intrauterine tamponade, the end of which was carried through the cervix into the vagina, the bleeding was controlled. The mother made an uneventful recovery and left the hospital with her baby on the twenty-first day.

CASE VI.—Mrs. O. H., aged 22, pregnant for the first time, entered my service at the Methodist Episcopal Hospital, May 11, 1907. Her pregnancy had been normal, except for almost constant headaches and marked edema of the feet during the last few weeks. She had fallen in labor during the afternoon of May 10. She was attended by a midwife until nearly midnight, when it was noticed that though the vulva bulged with each pain, no progress was made. A physician was then sent for who recognized the existence of a complication, and referred her to the hospital. On admission, her face, lower abdomen and legs were markedly edematous. Her pulse was 80 and of high tension, the pains were good, strong and regular, recurring every three to four minutes. The fetus was in the right dorsocephalic position, the fetal heart, 136. The fetal head was well above the brim and unengaged. Her external measurements were somewhat larger than the average. On vaginal examination, a large cystic tumor the size of a fetal head completely obstructed the true pelvis and pushed the posterior vaginal wall, which covered it anteriorly, forward and through the vulvo-vaginal orifice at each pain. The finger could not be pushed past the tumor. A diagnosis of incarcerated ovarian cyst obstructing labor was made. The patient was anesthetized and placed in the knee-chest posture, and an attempt made to displace the obstruction. This failed, and a Cesarean section was made, and the patient delivered of a nine-pound male child. The

uterine wound was sutured in the usual manner. The pelvic tumor was then freed from its adhesions and delivered through the abdominal incision. It proved to be a large suppurating dermoid of right ovary. This was tied off and removed, and the abdomen closed with tier sutures. The recovery of both patients was uneventful. An interesting feature in this case was the marked edema of the peritoneal coat of the uterus, which has since been noted many times when section has been made late in the labor.

CASE VII.—Mrs. H., aged 33, has had three children, all dead born. The first by podalic version, the last by craniotomy. The patient was very anxious to have a living child. She entered my service at the Methodist Episcopal Hospital, May 15, 1907, in the thirty-ninth week of her pregnancy. Pelvic measurements: Iliospinal, 25 cm.; ilio-cristal, 24 cm.; external conjugate, 17.25 cm.; conjugate vera (estimated), 9.5 cm.; occipito-frontal, 12.20 cm.; biparietal, 9.75 cm. (by Stone). In addition to these evidences of minor contraction and disproportion, the patient was suffering from a rectovaginal fistula, through which she was soiling the vagina continuously with fecal products. Elective Cesarean section was done on May 25, under chloroform-oxygen anesthesia, delivering a healthy boy. The postpartum head measurements confirmed the antepartum estimate. Time of the operation, seventeen minutes. Mother and child left the hospital on the twentieth day.

CASE VIII.—Mrs. F., aged 24, entered my service at the Methodist Episcopal Hospital, June 13, 1907. She had been married three years and had had one child fifteen months before, dead born (by craniotomy), at which time she sustained extensive lacerations of the cervix and a complete tear of the pelvic floor, which were subsequently repaired at a secondary operation. The patient had been in labor for sixteen hours when she entered the hospital, and there was no progress. Her measurements were as follows: Iliospinal, 22 cm.; ilio-cristal, 25 cm.; external conjugate, 17.5 cm.; conjugate vera (estimated), 9 cm. By cephalometry, the occipito-frontal measured 12.25 cm., estimated; biparietal, 10 cm. The child was lying in the right dorso-cephalic position, the head unengaged and semiflexed, with its saggital suture coincident with the transverse diameter at the brim. The cervix would admit but one finger after sixteen hours of labor, owing to a cicatricial atresia. The membranes were unruptured, the fetal heart was strong and counted at 134. Cesarean section was made, delivering a ten-pound seven-ounce boy, twenty-two inches long, and having the following head measurements: Occipito-mental, 14.5; occipito-frontal, 12.25; suboccipito-bregmatic, 11; biparietal, 11 cm.; bisacromial, 12.5. The wounds were closed in the usual manner, and the recovery was uninterrupted. Time of operation, sixteen minutes. The woman left the hospital with her healthy offspring at the end of three weeks.

CASE IX.—Mrs. C., aged 30, of very small stature, height five

feet, the husband a very large man. Married two years, one miscarriage at ten weeks in September, 1905. Her last menstruation was August 17, 1906. The patient was first seen by me in January, 1907, when she was pregnant about six months. Her measurements were as follows: Iliospatial, 21 cm.; iliocristal, 24 cm.; external conjugate, 17 cm.; depth of symphysis, 6.5 cm. I explained the dangers and difficulties of a labor through such a pelvis, and advised elective Cesarean at term, which advice was accepted. Antepartum examination, May 15, 1907, showed the child to be in a left occipitoposterior position, the heart of good quality and beating 148 (6 cm. to the left, and 2 cm. below the umbilicus). The occipitofrontal by Stone's method, measured 11.5 cm., the head resting on the pelvic inlet. On May 21, under a chloroform-oxygen anesthesia, a section was made, and a nine-pound boy delivered. At the request of the family both tubes were removed, and the wounds closed as in the foregoing cases. The antepartum fetal measurements were confirmed. Mother and child made a good recovery.

CASE X.—Mrs. R., a Russian, aged 20, seen in consultation June 20, 1907, a primipara. The patient had been in labor for twenty hours, the membranes had ruptured at the beginning of labor, the cervix was fully dilated, the position was right mentoposterior, the head incompletely extended and unengaged. The conjugate vera (estimated), 7 cm. Fetal heart audible, and counted at 150. The retraction ring was 5 cm. below the umbilicus. Patient was removed to the hospital and delivered by Cesarean. Child asphyxiated, but readily resuscitated by mouth-to-mouth insufflation. The recovery of the mother was uneventful after the first three days, during which time she suffered from tympany. Both patients left the hospital on the twenty-fourth day.

CASE XI.—Mamie G., aged 22, single, a hunchback, but four feet one inch in height. Kyphosis of the whole dorsal region, and involving the two upper lumbar vertebræ, entered my service at the Williamsburgh Hospital, November 25, 1905. She expected to be confined about the end of the month. Her measurements were as follows: Iliospatial, 22 cm.; iliocristal, 24 cm.; external conjugate, 16 cm.; depth of symphysis pubis, 9 cm. The abdomen was very pendulous. The child seemed well developed, and was lying transversely, with its head in the right iliac fossa. On November 30, a Cesarean was made through the usual incision, and a seven-pound girl baby delivered. The convalescence was smooth, and both patients were discharged at the end of three weeks.

CASE XII.—Mrs. B., aged 28, married and a primipara, was always well as a child. Began to menstruate at 13, menses recurring irregularly until marriage, flow lasting three days and painless. Was operated eight years ago for appendicitis. Her last menstruation was July 7, 1907. The patient entered my service at the Williamsburgh Hospital, April 18, 1908,

referred by Dr. R. A. Henderson at full term. Her pregnancy had been normal until within the past two weeks, when she began to complain of frontal headache and edema of the feet and legs. On examination, patient was 4 feet 10 inches in height, the abdomen was markedly pendulous, the height of fundus 36 cm., child was lying in a right dorsocephalic position, the head was unengaged. Her measurements were as follows: Iliospinal, $8\frac{1}{2}$, or 21 cm.; iliocristal, $9\frac{3}{4}$, or 25 cm.; external conjugate, 7 inches, or 17.5 cm.; depth of symphysis, $2\frac{1}{2}$, or 6 cm. A generally contracted pelvis was diagnosticated. Head measurements were not taken. The patient fell in labor on the evening of April 20, and after twelve hours of hard labor the head was still unengaged, and found to be unengageable by Mueller's method, applied under anesthesia with the patient in the Walcher position. A Cesarean was made, and a living male child delivered, weighing seven pounds eight ounces. One interesting point in this section was the torsion of the uterus to the left, the right cornu and tube presenting through the abdominal incision. The usual longitudinal incision was made in the uterine fundus and the child extracted by the feet. The uterine wound was closed with interrupted chromic sutures, and the abdomen with catgut in the peritoneum, and silk-worm-gut cross sutures through fascia, muscle and skin. The recovery of both patients has been uneventful.

CASE XIII.—Mrs. S., primipara, 24 years old, admitted to my service in the Methodist Episcopal Hospital, May 16, 1908, having been in labor for twelve hours, the child was lying in a left dorsocephalic position, the fundus was 35 cm. above symphysis, the head unengaged above brim, the fetal heart 144 below and to the left of umbilicus. The cervix was dilated to admit one finger. Her pelvic measurements were as follows: Interspinal, 22 cm.; intercristal, 27 cm.; external conjugate, 17 cm. The patient, being a primipara, was allowed a thorough test of labor. The pains continued for 45 hours, two hours in the second stage, yet the head remained unengaged. Preparation was made for an abdominal Cesarean. Before the abdomen was incised, a final attempt was made to engage the head by the method of Mueller; this failing, an abdominal incision was made to the right of median line, and the uterus exposed, incised, and a living child weighing eight pounds and eight ounces delivered. An anteriorly placed placenta, which was pushed aside, complicated the delivery. The uterus was somewhat edematous, and the membranes were adherent and difficult to remove. The muscularis was closed by interrupted chromic gut sutures, No. 2, at half-inch intervals, and buried by a running suture of fine catgut in the uterine peritoneum. The abdominal incision was closed by continuous cat-gut sutures for peritoneum, and interrupted cross silk-worm-gut sutures.

The contention of Reynolds, that the degree of stormy convalescence is proportionate to the duration of labor was demonstrated by this case, in that there was a hyperpyrexia of 102

to 104 for the first five days, associated with a very rapid heart, otherwise the recovery was uneventful.

CASE XIV.—Mrs. A. H., aged 29, entered my service at the Methodist Episcopal Hospital, June 6, 1908, with the following history. She was a woman of large build, and was married six years. She had had one child four and one-half years ago, born with instruments after forty-two hours of labor, at which time she sustained extensive lacerations of cervix, vagina and pelvic floor. This confinement was followed by prolapsus uteri, for which she was operated two years later. The cervix, anterior and posterior pelvic walls were repaired, and the uterus fixed to the abdominal wall with two silk-worm-gut sutures, passed through the fundus and abdominal parietes. Since the operation she has felt perfectly well, until she became pregnant in September, 1907. When about three months pregnant she began to have a dragging pain in the abdominal scar. On May 8, 1908, on antepartum examination, the uterine tumor lay obliquely in the abdomen, distending it laterally, the head was in the left iliac fossa, and the dorsum and breech in the right flank. The uterus was firmly adherent to the old scar for a distance of 7.5 cm. She was told to enter the hospital on the date of her expected labor which she did, or if labor should set in prematurely to go at once to the hospital. Her pains began on the morning of June 7, 1908, after six hours of labor, the head was still in the left lower segment, and the thinning of the right upper segment of the uterus became so apparent and the division of the organ into two distinct compartments became so marked with each pain, and no effacement or dilatation of the cervix having occurred, it was deemed wise to make a Cesarean, which was done about eight hours after the onset of labor. With the patient under chloroform-oxygen, the usual abdominal incision was made and the uterus exposed, and seen to be fixed by a wide fibrous adhesion 7 cm. long, arising from the posterior fundal wall and extending to the old abdominal scar, this adhesion divided the uterus into a large and excessively thinned-out right compartment, containing the child's body, placenta and liquor amnii, and a small compartment on the left containing the fetal head. An oblique incision from the right cornu was made in the uterus, down the anterior surface of the larger compartment, the placenta pushed aside, and a nine-pound living child delivered. The uterine wound was closed in the usual manner and both tubes excised. The peritoneum was closed with continuous catgut, and the fascia, muscle and skin with cross silk-worm-gut sutures. The immediate recovery from the operation was prompt and satisfactory, but on the second day the pulse rose and considerable tympany appeared, this was relieved by enemata. On the fourth day, a well-marked right-sided pleurisy developed, which cleared up under appropriate treatment. This was followed on the eighth day by the occurrence of an intestinal fistula, in the lower jejunum or upper ileum, at the site of one of the cross sutures, evidently due to a

needle puncture, and inclusion of the gut in the suture at the time of operation. Conditions improved for the next seven days, the pulse and temperature coming down to 99 and 100, respectively, when, on the sixteenth day, the patient developed a diphtheritic condition of tonsils, fauces and soft palate. Cultures showed a mixed infection, and she died of exhaustion and a hypostatic pneumonia on the twenty-first day. This case illustrates one of the accidents of abdominal surgery which may occur with the use of through-and-through or cross sutures, when used after the peritoneum is closed.

287 CLINTON AVENUE.

INFARCTION OF RENAL CORTEX IN PREGNANCY.

BY

OSKAR KLOTZ,

Montreal.

(With one illustration.)

Clinical History.—Mrs. J., age 25 years, was admitted to the Maternity Hospital on August 29, 1907, suffering from severe edema of the extremities and vulva. She was a primipara, and about the middle of August she had consulted Dr. G. A. Berwick. She was then about seven and a half months pregnant, and gave a history of being well up to the beginning of August, when she began to suffer from insomnia. She was very pale. A specimen of urine when heated became practically solid with albumin. She was put to bed August 24 and given a liquid diet and free saline purgation. She did not improve, and on the twenty-ninth was sent to the hospital. There was now tremendous edema of the vulva, which, in spite of treatment, seemed to increase, and on the thirty-first the question of immediate delivery was considered. Dr. Berwick, in conjunction with Dr. Chipman, decided that a Cesarean section was the easiest mode of delivering the patient, as the vaginal route was impossible, owing to the edema. The operation was performed on the same day under chloroform anesthesia, and the patient recovered fairly well from it. On the day of the operation, however, no urine was passed. She was then catheterized daily, and the amount of urine varied from 95 c.c. to 355 c.c. per diem. On the sixth day after the operation, September 5, only 105 c.c. were passed. At about eleven o'clock on this day the patient had two convulsions, each of which lasted a few minutes. By copious bleeding from the arm, the patient was aroused from her stupor and seemed fairly well. The pulse, however, re-

mained weak, and there was occasional dyspnea for some days following. On September 11, patient complained of pain over the heart.

During her stay in the hospital, patient was given frequent hot packs, some of which were effectual. At no time did the temperature exceed 99.6. The patient died on September 13, 1907.

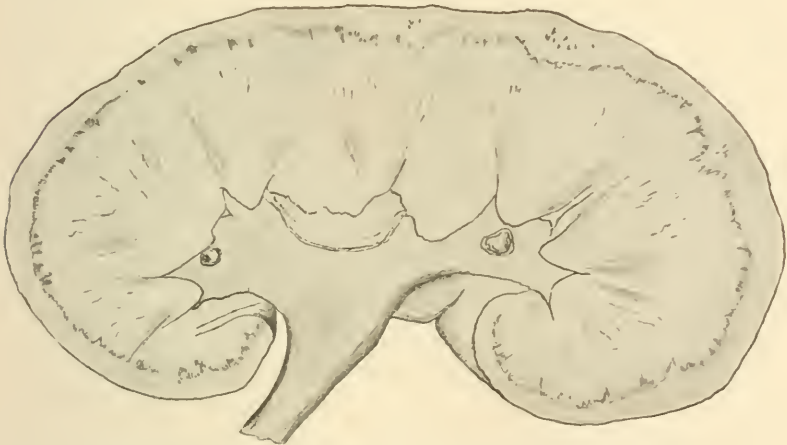
URINE CHART.

- 24 hours, ending Aug. 29, 150 c.c. urine.
- 24 hours, ending Aug. 30, 300 c.c.
- 24 hours, ending Aug. 31, catheterized. No urine.
- 24 hours, ending Sept. 1, 153 c.c. plus.
- 24 hours, ending Sept. 2, ——— (voided with stools).
- 24 hours, ending Sept. 3, 110 c.c. plus.
- 24 hours, ending Sept. 4, 200 plus amt. voided with stool.
- 24 hours, ending Sept. 5, 105 c.c. plus.
- 24 hours, ending Sept. 6, 160 c.c. plus.
- 24 hours, ending Sept. 7, 95 c.c.
- 24 hours, ending Sept. 8, 180 c.c.
- 24 hours, ending Sept. 9, 205 c.c. plus.
- 24 hours, ending Sept. 10, 465 c.c.
- 24 hours, ending Sept. 11, 200 c.c. plus.
- 24 hours, ending Sept. 12, 250 c.c.

An autopsy was performed eight hours after death. The body was that of a large and well-built woman, appearing older than the stated age. The entire subcutaneous tissue of the body was edematous, and more particularly was this evident in the lower extremities and vulva. There was an incision (Cesarean section) in the median line of the abdomen, which was partly healed. There were a few stitch-hole abscesses in the skin. In the thoracic cavity there were a few adhesions of the right pleura and the right cavity contained about 300 c.c. of clear yellow fluid without fibrin flakes. The pericardium did not contain excess fluid, but its surfaces were covered with a thin layer of granular fibrin, which could be readily removed. The pericardium underneath was somewhat injected. Lung tissue was heavy and edematous. The valves of the heart were normal, but there was some dilatation of both ventricles. The musculature of the heart was very flabby, and the cut surface appeared cloudy. There were about 600 c.c. of clear fluid in the abdomen. There were a few old adhesions about the liver.

Liver tissue appeared edematous. The bladder was small and contained a little thick urine. The walls of the bladder were injected and covered with a thin mucopurulent layer, smears of which showed various organisms. The uterus was fairly large, but well contracted. Suture line along the fundus of the organ was healthy. The cavity of the uterus was healthy, and no organisms could be found in the smears made therefrom.

The two kidneys presented the same appearance. Each organ was large and of the "hogback" variety. The capsule was thin and peeled off readily without removing any of the kidney tissue. The surface of the exposed kidney had a remarkable appearance, being of a golden-yellow color with blotches



Complete infarction of renal cortex. Showing hemorrhagic zone and necrotic border.

of dark red injected vessels along the borders of the poorly demarcated lobules (stellate veins). The whole surface of the kidney presented this appearance, while the cut surface, too, was much mottled. There was a striking contrast between the medulla and the outer border of the cortex. The medulla and the contiguous part of the cortex were about normal in appearance or a little darker than usual. The outer margin of the cortex, on the other hand, was of a bright yellow color, having here and there small punctate hemorrhages scattered through it. No structure could be made out in this outer portion of the cortex, which appeared like necrotic tissue. Between the inner and outer zones of the cortex was a hemor-

rhagic zone distinct from each. This hemorrhagic zone had a more brownish color than the congested medulla, and small hemorrhages could be noted in it. These characters of differentiation between the inner and outer zone of the cortex could be followed about each pyramid, even where the cortex in its convolutions dipped below the surface. In no part of the cortex were the Malpighian corpuscles to be seen. The main renal arteries were healthy and not sclerosed, nor were thrombi or emboli to be found in them, as far as they could be examined by the naked eye. All the vessels had a normal appearance in the medulla. The pelvis of the kidney was a little injected.

Microscopical.—The sections of the kidneys showed a remarkable appearance. The outer zone of the cortex showed the tubules and glomeruli lying in their places, but devoid of nuclei. They appeared here only as the outlines of their former characters. The individual cells had retained their shapes and were arranged in their proper places in the tubules. The blood-vessels in these parts were without nuclei, and contained in their lumina thrombi made up of a fine granular material. These thrombi contained no inflammatory leukocytes, nor were bacteria to be found in them. One was reminded of the appearance of the thrombi which occur in the capillaries of the liver in the areas of focal necrosis in typhoid fever and eclampsia. Occasionally small areas of healthy cortex were found immediately beneath the capsule, with small and healthy blood-vessels in them. These parts were apparently nourished by vessels dipping in from the capsule. The glomeruli in the necrosed cortex suffered with the rest of the tissue. The capillaries in these glomeruli did not show the granular débris noted in the cortical arteries, nor was there any evidence that thrombosis had occurred here. A few of the glomeruli in the necrotic zone were fibrosed. The deeper portion of the cortex was intact and showed the glomeruli and tubules with healthy cells. There was, however, in these areas, evidence of former change. The lumina of the tubules were enlarged and contained some débris, their epithelial cells were ragged and eroded. A few of the glomeruli had thickened capsules. Between this inner zone and the necrotic layer was an area in which the vessels were congested and in places small hemorrhages were noted. In this intermediate zone the interstitial tissue was in places crowded with a leukocytic infiltration, which at times stretched into the necrotic zone. The necrotic areas containing leukocytes showed more advanced

degeneration of the epithelial cells, for in these parts the individual cells could no longer be distinguished, but they were fused into a homogeneous mass. The thrombosed vessels in the intermediate zone of the cortex showed only a granular mass of broken-down cells without leukocytes. In other vessels the granular plugs were replaced by fibrin masses which had blood pigment entangled in them. These thrombi, although closely set upon the vessel wall, showed no site of commencement for the fibrin deposit. Some of the tubules in the inner zone of the cortex were calcified. This calcification affected mainly the epithelial cells of the loops of Henle. Only rarely were leukocytes seen within the tubules. Hyaline casts were seen in the straight tubules of the medulla. The arteries of the medulla and cortex did not present any changes in their walls, and nothing of the nature of an endarteritis could be found. No bacteria could be demonstrated in the sections.

Liver.—Sections of this organ showed no sign of necroses, but there was some fatty infiltration in the peripheral zones.

In the literature I have been able to find three similar cases. The first is reported by Bradford and Lawrence in 1898. The case was of a woman, aged 36, who came under their notice with the complaint of inability to micturate since confinement, which had taken place three days previously. Although there was almost complete suppression, there had been no convulsions nor sign of uremia. At her previous confinements the woman had never had any kidney trouble. There was no evidence of infection. The suppression lasted for seven days, when the patient died. At autopsy, there was edema of the lungs and a complete bilateral infarction of the outer zone of the renal cortex, as we have described in our own case. The authors noted an endarteritis of the smaller renal vessels, along with a thrombosis of the interlobular arteries. Bradford and Lawrence believe that the kidney lesion was the result of the diseased arteries.

The second case is reported by Griffith and Harringham in 1906. The case was a woman, a multipara, aged 35. She was pregnant, and was delivered of a dead child. Immediately following confinement, suppression of urine and anasarca began. There was no sepsis. The patient developed uremic symptoms, with headache, vomiting and delirium. The suppression lasted ten days until the patient's death. There had been a previous history of chronic nephritis, which became worse with each pregnancy. At autopsy, there was edema of the lungs and a

cortical renal infarction. The authors noted some old fibrosis of the kidney and also a slight endarteritis. The interlobular arteries were thrombosed. The endarteritis was of slight degree and the authors do not consider it a factor in the process of infarction.

The third case, reported by Jardin, is of a woman of 36 years. She was a multipara, but no note is made of the renal conditions at the former pregnancies. A suppression of urine set in after the delivery of a seven-months fetus. Before the confinement the patient was very restless, and showed edema of the face and extremities. The urine at this time contained much albumin, but there was an ample secretion (thirty-five ounces in twelve hours). The suppression, beginning after confinement, continued for five days until the patient's death. At autopsy, an edema of the lungs was noted, as also an extensive infarction of the renal cortex. The small vessels in the cortex were thrombosed, but there was only slight evidence of endarteritis in the vessels.

There is a striking similarity of these three cases with our own, differing only in unessential points, which I believe have no bearing on the lesion in question. All the cases occurred in pregnant women, ranging in age from 25 to 36. The suppression of urine began in each case immediately after confinement, and continued until the death of the patient. One can logically assume that the cortical infarction began with, or was the cause of the suppression from its commencement. The suppression lasted in these cases from five to thirteen days. In some of the cases uremic symptoms were present, but in the case of Bradford and Lawrence, though the suppression lasted for seven days, uremic symptoms did not occur. The appearance of the kidneys, both macroscopically and microscopically, was almost identical in all the reports, and in all there was noted the extensive thrombosis of the small renal arteries lying along the inner zone of the cortex. Septic conditions were not to be found in any of the kidney specimens examined. In the case of Bradford and Lawrence an endarteritis of the smaller renal arteries was observed, and considerable stress was laid upon this condition by the authors.

What is most striking is that a very definite part of a functioning organ should be completely affected by a process of infarction. It is evident that in these cases the part involved was not a mere chance selection, but that most probably the

function of the organ and the relation of the blood-supply to the secreting apparatus played an important rôle.

The thrombi in the interlobular arteries are peculiar, and, as I have stated above, remind one of similar processes found in the liver. Red cells are not to be made out in the thrombotic masses, nor are any other cell structures to be noted in them. One is led to assume that the blood elements, which must have been present during the process of thrombosis, or have been a part of it, had undergone destruction or dissolution. That some débris of the red-blood cells is incorporated in the thrombi is evident in the staining reaction for iron, which gave positive results.

Although in the case here reported there was evidence of infection (probably terminal) in the pericardium and in the bladder, the conditions cannot be co-related with the kidney lesion. The infective processes were late complications, as the pericarditis was evident only two days before death, and the cystitis was noted on the same day. On the other hand, the kidney symptoms antedated the infective processes eleven days, and in the kidney specimens no bacteria were to be found. The simultaneous involvement of both kidneys, and the complete thrombosis of all the arteries of the same diameter and in exactly the same location, appears to me very significant. In the case reported every artery of the mid-zone of the cortex was plugged, while the vessels of all sizes in the medulla, from the smallest to the main renal trunks, remained free. Likewise, the capsular arteries were unaffected, and by their blood-supply small islands of the outer cortex were preserved from death.

From this evidence I cannot agree with Bradford and Lawrence in the contention that an endarteritis was the causative factor, for infarction was absent in other parts where an endarteritis was also present. Under their contention the occurrence of this extensive infarction: (1) in only females; (2) following pregnancy; (3) with complete and bilateral involvement of the one zone of the cortex, remains unexplained. One would expect that extensive cortical infarction would be more prevalent, in both men and women, if an endarteritis were the cause. Chronic interstitial nephritis of the arteriosclerotic type, with its manifold arterial lesions does not call forth cortical infarction. The thrombi in the cortical vessels appeared to have no association with the arterial walls. Inflammation in the arteries was lacking, and there was no sign of a gradually developing thrombosis in any one branch and spreading to the other vessels.

From the clinical evidence of rapidly developing suppression, and from the microscopical picture of the granular thrombi, I believe the thrombosis occurred simultaneously in all the renal vessels, as a result of certain metabolic changes of secretion in pregnancy. What these changes are I cannot venture to say. But, as a result, there has occurred a dissolution of the red-blood cells in this particular part of the arterial tree, and the débris—and possibly the agglutination of these cells, has led to a plugging of the smaller arteries. To be exact, this process is rather an embolic one, coupled with thrombosis, and is similar to the agglutinated red-cell thrombosis in the liver. Evidence is lacking to assert that an increased coagulability of the blood had been produced in this portion of the arterial system and had led to a blocking of the cortical arterial stream.

My thanks are due to Dr. G. A. Berwick, for the permission of reporting this case.

OVARIOTOMY DURING PREGNANCY.*

BY

CHARLES GREENE CUMSTON, M.D.,

Boston, Mass.

DURING the past ten years I have had occasion to interfere for ovarian cystomata during pregnancy five times, and it occurred to me that a paper on the subject might not be out of place at the present time.

The first case was a cyst the size of a fetal head at term and proved to be a dermoid, which must of necessity have been present for a considerable length of time, but had never been discovered until the patient was pregnant for the fourth time. M. M., thirty-seven years of age, had given birth to three healthy children, all the labors having been easy, requiring no instrumentation. The last child was born three and a half years ago. When seen in consultation the patient was about nine weeks pregnant and complained of severe pains in the back and abdomen. By examination a right-sided, movable cyst was easily made out. Laparotomy revealed a dermoid, which contained hair and fat. Forty-eight hours after the operation labor pains of a mild character commenced, but were controlled by rectal enema of chloral and ammonium bromide in large doses. They

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disappeared completely at the end of forty-eight hours, and the patient went to term, being delivered of an eight-pound girl.

If the symptoms, which cause the patient to consult a physician, are considered, one will usually find that they consist of abdominal pain and backache, coming on rather suddenly and from no evident cause. Most of these patients feel relatively well until the tumor gives rise to pain. In my second case the symptoms were so severe that one might almost be led to suppose that intestinal obstruction was taking place. Mrs. F. W., twenty-nine years of age, had given birth to two healthy children, the labors being uncomplicated. Six months after the last labor she aborted for no known cause at about the third month.

After the abortion the menstruation occurred four times, the last being nine weeks previous to my visit. The patient, who had always considered herself in excellent health, noticed that her abdomen was still somewhat increased in size after the miscarriage. She then commenced to complain of very severe abdominal pain accompanied by vomiting, chills and a slight rise in temperature. The patient was carefully watched for a few days, when these rather violent symptoms subsided. Examination revealed a uterus about the size of a two months' pregnancy and lying behind it was found a cystic tumor. Operation was advised and accepted.

The walls of the cyst were somewhat adherent to the parietal peritoneum and omentum. A dark, reddish-colored fluid was let out from the cyst, after which the pedicle of the tumor was examined and found twisted on its axis twice. It was full of ecchymotic spots. The after-progress of the case was perfectly satisfactory and at no time was there any evidence of a commencing miscarriage. She was delivered spontaneously at term.

In the following case the patient had been cognizant of a gradual enlargement of the abdomen for a number of months, but as there had been no symptoms, no medical advice had been sought when on account of sudden intraabdominal pain, I was asked to see the case. The symptoms presented were certainly peculiar; in a very short time prolapsus had occurred, and for a fortnight before seeing the patient, there had been considerable disturbance in the micturition, to such an extent that, on account of the retention, the bladder had to be emptied with a catheter. The pathologic condition found at operation explains the symptoms.

Mrs. W. H. G., thirty-nine years of age, had had two

normal pregnancies, the last seven years ago. The last menstruation occurred four months ago, at which time a considerable amount of blood was lost. For the past three weeks the patient has noticed the development of a prolapsus and for the last fourteen days has complained of pain in the abdomen and the sensation of severe pressure when passing urine. Three days before we saw her a catheter had to be passed on account of retention. Upon examination the cervix uteri protruded through the vulva. The corpus uteri was retroflexed and lay in the small pelvis. In direct connection with the organ was found a tumor, probably of a cystic nature, extending considerably above the umbilicus. Laparotomy revealed a cyst on the left the size of an adult head which was nowhere adherent. It had displaced the uterus to such an extent that a torsion of the organ had resulted in the supravaginal region. The torsion was about 140° . After the cyst was removed the uterus was readily straightened and brought into normal position. The ultimate outcome of the case was satisfactory and an examination made one week after the operation showed the uterus in its normal position. The patient went to term and had a normal labor.

According to Jetter's statistics, there were thirty-one dermoids out of a total of 105 instances of ovarian tumors occurring during pregnancy. This would make 19 per cent. of dermoids when, generally speaking, relationship of dermoids to other ovarian cystomata is about 4 per cent. Stauda explains this frequency of dermoids, as found during pregnancy compared to other cystomata, from the fact that their growth is slow and gives rise to few symptoms, so that the patients do not come under medical observation, whereas in other more rapidly growing cysts, they come under treatment much earlier and are operated on when no pregnancy is present. Martin also believes that dermoids, owing to their pelvic situation, are less likely to be discovered than the more superficially situated cystomata.

Generally speaking, diagnosis of ovarian growths during pregnancy can be made with ease, but in one of my cases it was only a probability, and, as will be seen, this case shows how, under some circumstances, the diagnosis may be far from easy, because, in spite of the fact that the pregnancy had reached nearly the sixth month, it was impossible to palpate the uterus on account of the very large size of the neoplasm. It is possible that under narcosis I might have been more successful, but, as

operation was indicated, it was considered needless to submit the woman to more than one etherization.

Mrs. H. F. C., thirty-two years of age, married seven years, had never been pregnant. The menstruation had always been regular and painless, but has been absent for five months. For about two years the patient has noticed a gradual increase in the size of her abdomen, although she has never suffered. Ten days before coming under observation, she was suddenly taken with very acute pains in the abdomen and these have steadily increased. The abdomen is enormously enlarged, and when the patient is in the erect position it sags forward. Percussion gives a clear note all over the abdomen, excepting in the left hypochondrium where a tympanitic note can be elicited. A distinct fluctuation could be made out. The bases of both lungs were pushed upward. The vaginal mucosa and cervix are of a dark blue color and extremely lax. The anterior and posterior vaginal culs-de-sac are prolapsed, and distinct fluctuation can be detected in the posterior cul-de-sac. The uterus and adnexa cannot be palpated. After incision of the abdominal walls a sticky fluid made its exit under high pressure, about twelve to fifteen liters being voided. After this had occurred it was found that there was no ascites, as we had at first suspected, and that the walls of the cystic growth were intimately adherent to the peritoneum. With considerable difficulty the cyst was finally peeled off, a short pedicle was found with difficulty and ligated. After the cyst had been freed, a five months' pregnant uterus came into view. Recovery was uneventful and the patient was delivered by her physician at term.

The indication for operative interference during pregnancy is usually due to the severity of the symptoms presented by the patient. These usually appear rather suddenly and indicate in many instances that some change has taken place in the growth. In the last-mentioned case the great dimensions of the growth in itself, combined with pregnancy, were enough to cause serious danger to the patient. The difficulty in micturition and the prolapse in my third case would also have led to serious complications, even if the uterus had not undergone torsion. According to Martin, only two instances of cases of ovarian tumor complicating pregnancy are known in which hyperemesis was the principal symptom and indicated operative interference. One of these cases, which was recorded by Atlee, died in spite of removal of the growth thirty days after the opera-

tion from exhaustion, while the second patient, who was under the care of Mangiagalli, continued to vomit after ovariectomy had been done, so that he was obliged to empty the uterus, this resulting in recovery. Now, while in both of these cases, removal of the cyst had no influence upon the hyperemesis, I saw in consultation one case occurring in the practice of another surgeon where vomiting stopped after the interference and pregnancy continued to term.

In my fifth case I removed the cyst by posterior colpotomy, and, although much has been said about the dangers connected with this operation when undertaken during pregnancy, it will be seen that, at least in this case, no difficulties presented themselves. It has been upheld that the vaginal route is more apt to give rise to interruption of pregnancy than abdominal incision, because more manipulation is required for the removal of the growth, and consequently more direct irritation is caused to the lower uterine segment, but in my case the growth was very movable, about the size of a large orange and laid directly in the small pelvis; consequently, it seemed rather more proper to remove it per vaginam. What we particularly noted was that excessive bleeding of the vaginal incision did not occur. The history of the case is briefly as follows:

Mrs. M. W., thirty-four years of age, had been previously delivered of two healthy children. For the last three years her menses had been irregular, sometimes occurring every three weeks, at others every five or six. The last menstruation was four months ago. For several weeks she has complained of rather sharp pain in the right side. Upon examination the uterus was found enlarged, corresponding to a pregnant uterus between the third and fourth month. Behind it and somewhat to the left a movable elastic tumor could be detected. Posterior colpotomy. Upon incision of the vaginal vault no marked hemorrhage was encountered. Upon opening the abdominal cavity a cystic tumor presented itself directly into the vaginal wound. Pushing the uterus to the side, the growth was easily brought down and its pedicle clamped. During this maneuver the cyst was ruptured, its contents proving that it was a dermoid. The pedicle was easily ligated and the cyst removed. The pedicle was reduced into the abdominal cavity and the colpotomy incision closed; recovery was uneventful, the patient going to term and being delivered without complications.

As to the frequency of miscarriage occurring after abdominal

or vaginal operations, I am unable to find any statistics of value, but, generally speaking, it would seem that, at least in the case of ovarian cystomata, this unfortunate occurrence is not frequent. Circulatory disturbances following operation have been accused as the cause for interruption of pregnancy, and these may naturally occur whether the cyst is removed by abdominal incision or per vaginam. At the present time I believe it may be said that ovariectomy during pregnancy is a justifiable procedure and should always be resorted to when indications present. It is evident that colpotomy is a simpler operation, and in my opinion, when the existing conditions are such that it can be undertaken, it is preferable to abdominal incision.

There is no doubt whatever but that the severity of the operation, the length of time consumed and so forth, influence the pregnancy, and another most important factor in the production of miscarriage is, to our way of thinking, a cooling of the abdominal organs and peritoneal cavity during laparotomy. If we are correct in this supposition, then posterior or anterior colpotomy should be selected when possible. When the cyst is small and located in the small pelvis, and if it is movable, removal per vaginam seems proper, because there is less intra-abdominal manipulation.

Of the complications found during operation, I would call particular attention to torsion of the pedicle and, whether this occurs during pregnancy or not, the symptoms to which it gives rise may simulate acute or chronic intestinal obstruction or appendicitis. In my second case the violent symptoms presented by the patient were undoubtedly due to the torsion of the pedicle. From reported cases, adhesion of the tumor with the neighboring organs, the omentum or intestine, is not uncommon, and in one of my cases these united the growth so firmly to the parietal peritoneum that the tumor ruptured before it was first noticed. Marked displacement of a pregnant uterus is also common in these cases and torsion of the organ may occur. The greatly elongated prolapsed cervix in this case may, in all probability, be accounted as a result of edema of the cervix, due to shutting off of the vascular supply and the prompt recovery of this symptom after operation would seem to favor this theory.

Pregnancy complicated by ovarian growths has been considered rather infrequent when one considers the great frequency of ovarian tumors. This rarity has been accounted for by the

fact that women having pathologic changes in the ovaries generally conceive less readily. Now, although without any doubt this may be quite correct, that the diseased ovaries are the cause of sterility, still, as a matter of fact, numerous cases have been recorded in which, in spite of advanced degeneration of both glands, pregnancy nevertheless occurred. The fact that in such cases conception did take place simply goes to show that a portion of healthy ovarian tissue is sufficient for the occurrence of normal ovulation. I have had one case, where, on account of cystic changes in both ovaries the patient, having been married for a number of years, had never been pregnant and had been a great sufferer. I removed one ovary and resected two-thirds of the other, with the result that a few months after operation, she became pregnant and was delivered at term of a robust child.

Personally, I am of the opinion that cystomata complicating pregnancy is much more frequent than has been generally admitted because it must be that very many cases where there is pregnancy complicated by an ovarian tumor, do not come under surgical observation for the simple reason that no symptoms arise. Then, again, we all know that an accidental discovery of an ovarian tumor during pregnancy, labor or the puerperium is often made, the case having run a symptomless course. Furthermore, among patients who are operated on for ovarian growths those who have been sterile are far from representing the majority, and I believe that, in going over statistics, one will usually find that they are multiparous in a large proportion, so that it may be assumed correctly that the growth existed during the patient's last pregnancy. Reamy, out of 257 cases of ovarian growths, found that there were 321 pregnancies and 266 normal labors. Reports from obstetric clinics show beyond doubt that small ovarian growths frequently remain undiscovered if no definite symptoms are present causing an examination of the patient to be made. I would point out what seems to me a rather astonishing statement, viz., that out of 17,832 labors taking place in the Obstetrical Clinic of Berlin, only twenty were complicated with ovarian growths. Dohrn believes that pregnancy complicated with ovarian tumors may be placed at 4 per cent., while Williams has stated that such growths are observed relatively less frequently in married than in single women. This peculiar relationship may possibly be explained by the fact that unmarried primiparæ are examined much more

frequently during pregnancy or labor, because they represent the largest contingent of public obstetrical clinics.

From what has been said, it becomes evident that, even with the presence of an ovarian tumor, pregnancy, labor and the puerperium may give rise to no disturbances and a large number of cases have been reported in which, in spite of certain complications, the patient has had a normal labor without surgical interference. In the majority of these cases, it is probable that the growth was of a benign nature and of slow development, in which instance it is likely that the tumor was a dermoid. For all that, it should not be said that the prognosis is good, generally speaking, although so many favorable cases have been reported, and in every instance where an ovarian tumor is found accidentally during pregnancy, labor or the puerperium, the physician should realize that he is dealing with a serious condition of affairs which at any moment may result fatally for the patient. The interchangeable relationships between ovarian tumors and pregnancy, labor and the puerperium are very numerous, and reference will be made to them later on.

Opinions are divided as to the influence of pregnancy on ovarian growths. Undoubtedly, if a patient the possessor of an ovarian tumor becomes pregnant, the symptoms, if already present, will become more marked. The theory put forward by Leopold and Wernich, that ovarian growths complicated by pregnancy have a tendency to undergo malignant transformation, is a much-discussed question. If this theory be correct, then, in reality, one would encounter malignant transformation in these growths during pregnancy very much more frequently than is actually the case. In point of fact, not a single instance recorded by these authors strengthens their theory, because they could not prove that the neoplasms were not originally malignant. On the other hand, I believe it is generally admitted that pregnancy influences the growth of ovarian neoplasms. The increased blood-supply to the genitalia resulting from conception should, theoretically, increase also in the tumor, which naturally would result in a more rapid growth; but other authorities believe that the increase of the vascular supply existing in the uterus and ovaries is only manifest during the first three months of pregnancy, as is shown by the development of the corpus luteum verum, and that during the remainder of the pregnancy ovarian activity ceases completely, and consequently there is no cause for an increased blood-

supply to these glands. Other competent writers maintain that the blood-supply to the ovaries is less during pregnancy, because the premenstrual congestion, which, according to them, is the principal reason for the growth and development of ovarian tumors, does not take place during pregnancy. Consequently they maintain that, when ovariectomy is done during pregnancy, and an increased vascular supply and extravasated blood is found in these growths, this should not be considered as the result of an increased arterial supply, but rather the result of stasis from venous reflux. If these facts be correct, pregnancy should have a retarding influence on the growth of these tumors. A number of investigators have come to the conclusion from their own observations that, owing to the enlargement of the uterus, the resulting limitation of space would hinder further development of ovarian growths. According to this point of view, which, in reality, is of no very great importance, after the uterus becomes empty, an immediate and rapid growth of the neoplasm would naturally be expected, and Sir Spencer Wells made the observation that ovarian tumors decreased in size during pregnancy and after labor again increased in size. Now, although the theory that ovarian tumors evince a greater tendency to increase in size after pregnancy has taken place, cannot be upheld as absolute so far as its correctness is concerned, it nevertheless remains a fact that the dangers of ovarian tumors in pregnancy are many.

In the first place, one should take into consideration the disturbances in the blood-supply which arise as a result of the particular position of the growth, with or without torsion of the pedicle. Displacements of these tumors can easily be explained by the gradual pushing up of the abdominal organs and those contained in the small pelvis by the constantly increasing size of the pregnant uterus. Löhlein after a careful study has come to the conclusion that torsion of the pedicle occurs in 8 per cent. of these cases. Aronson found torsion of the pedicle eight times in seventy-two ovariectomies performed during pregnancy, thus making 12.8 per cent., while Dsirne met with it ten times in 109 cases; in other words, 9.1 per cent. From these figures the first conclusion to be drawn is that certain writers have laid too much stress upon the enlargement and upward growth of the uterus, and that the influence of pregnancy and the placenta upon the blood-supply of the ovarian cystomata has been much overrated. On the other hand, Löhlein does not attribute

much to pregnancy as far as circulatory disturbances from a twisted pedicle are concerned, but is of the opinion that, during the postpartum this complication is much more frequent. He points out that the anatomical conditions after labor are particularly favorable for the occurrence of torsion, because, in the first place, the pedicle has been greatly stretched on account of the upward growth of the corpus uteri and to this is added the sudden decrease in the abdominal contents following the emptying of the uterus and which leaves behind it relaxed abdominal walls. All these circumstances naturally allow an ovarian cyst to become very movable if the latter is not adherent nor of very large size. If, to this is added a rapid change in the location of the tumor, then torsion of the pedicle or its rupture may easily result.

It would seem evident that pregnancy, in which the change in the position of the abdominal viscera takes place gradually leads to a constant limitation in the mobility of the various abdominal viscera and the tumor, a condition of affairs not favorable to the development of torsion. Besides, in most cases, torsion of the pedicle during pregnancy will occur so gradually if no trauma is inflicted that oftentimes it does not lead to severe symptoms, such as are encountered in a torsion suddenly taking place and giving rise to hemorrhages into the cyst. That intracystic hemorrhages giving rise to peritoneal symptoms may take place during the puerperal state without any twisting of the pedicle is a fact too well known to cause any comment here. In many of these cases the cause of the symptoms was a rupture of the pedicle which, perhaps, was overlooked at the time of the operation.

Under some circumstances torsion of the pedicle, by cutting off the blood-supply to the growth, may result in atrophy of the latter, until a blood-supply is again given it through peritoneal adhesions contracted by the tumor. A decrease in size of ovarian cystomata during pregnancy has been observed by a number of competent men. Cases in which intracystic hemorrhage has given rise to alarming symptoms have been reported a number of times. Suppuration of the cyst during pregnancy is a very serious complication, and when the growth is small and not easily detected the diagnosis is a very delicate matter and oftentimes not made until the abdominal cavity has been opened.

Just as under certain circumstances the occurrence of pregnancy may exert an unfavorable influence upon an existing ovar-

ian tumor, so may the tumor itself influence unfavorably pregnancy, labor or the puerperium. The presence of the ovarian cyst may without any doubt produce premature labor, especially if, on account of the tumor, a retroflexion of the uterus results, or on the other hand, if, from the size of the cyst, development of the uterus is much interfered with. However, I am under the impression that perhaps too much stress has been laid to this factor, because in many cases the most peculiar displacements, of the uterus may occur and still pregnancy go to term.

I believe that it can be safely admitted that those cases in which pregnancy goes to term, in spite of the presence of an ovarian cyst, represent the majority. Frequently, the influence of the tumor on the pregnancy is merely represented by an increase of the physiological symptoms of pregnancy, a condition of affairs which causes the patient to consult a physician who then discovers the growth.

The disturbances during pregnancy may become so severe owing to the presence of a tumor that they certainly are an indication for ovariectomy and experience also teaches that the good results of operative interference in such cases have not been exaggerated, because, very frequently, the distressing symptoms, which up to that time had failed to be relieved by proper therapeutic measures have disappeared at once after the operation. However, just how much hyperemesis is influenced psychically by the operation is difficult to ascertain.

Very large ovarian cystomata may become a source of danger, in that they tend toward the production of dyspnea, albuminuria and edema, particularly toward the end of gestation. Labor, without doubt, can proceed spontaneously without any difficulty in spite of the presence of an ovarian cyst. This is made evident from the fact that the tumor is not infrequently discovered after birth.

While large growths may sometimes cause disturbances in the uterine contraction or displacement of the uterus, with a consequent abnormal position of the child and disturbances in the placenta, small tumors may cause serious interference during labor when they directly obstruct the birth-canal and cannot be reduced. In these cases everything depends upon the possibility of reduction of the growth into the abdominal cavity. To obtain this result many methods have been advocated which, even under the most difficult circumstances,

may possibly be crowned by success. If, in such cases, spontaneous rupture of the cyst occurs, there is still a certain amount of danger for the mother. The possibility of strangulation of the tumor during labor certainly should have great weight when considering the proper treatment to pursue, and also in those cases where the growth has never given rise to any symptoms and has only been discovered accidentally during pregnancy.

The puerperal stage is, generally speaking, the least affected by the presence of ovarian cystomata as long as torsion of the pedicle does not occur. Disturbances of involution are certainly quite possible and have been observed, but they are generally of slight importance if postpartum hemorrhage arising directly after labor as the result of insufficient uterine contraction is not considered here. In order to avoid the unpleasant accidents resulting from a twisted pedicle during the postpartum, absolute quiet and a well-applied abdominal binder have been recommended.

Regarding the diagnosis, it may be said that, differentially, errors are most likely to occur when a very large cyst exists with a pregnancy in its early stages, especially when absence of menstruation is looked upon as a symptom of a commencing menopause, or disturbances in the menstruation resulting from ovarian trouble, because palpation of a slightly enlarged uterus in connection with a large abdominal tumor may be very difficult or even impossible, especially if the tumor is intimately adherent to neighboring organs, thus interfering with the mobility of the uterus. Under these circumstances, the tumor is diagnosed, but not the pregnancy and a large number of such cases have been recorded where abdominal section was done for the ovarian tumor and the pregnant uterus only discovered at the time of operation. It is quite evident that the number of such mistakes must be large.

It has also happened that a pregnant uterus has been mistaken for an ovarian cyst and has been incised, when the true condition of affairs was discovered. When small cysts exist, which are closely adherent to the uterus, they may be easily diagnosed as extrauterine pregnancy. The soft, elastic ovarian cyst gives to the feel the impression of an impregnated tube, while the enlargement of the uterus which is always found in extrauterine gestation is naturally accounted for. The possibility of such an error is particularly probable when an ovarian

tumor of long standing, causes, by the suppression of the menses, symptoms of the beginning of pregnancy. Under some circumstances it is possible in these doubtful cases to come to a correct diagnosis only after repeated examinations have been made at intervals of two to three weeks, provided that serious symptoms do not compel the surgeon to interfere at once before the diagnosis is definitely determined.

The necessary gentleness in palpation, when one suspects a tubal pregnancy, is another cause of difficulty in making a diagnosis. The introduction of a uterine sound which has been recommended, but which, in my opinion is absolutely dangerous and should be proscribed, can at the most be only justified when intrauterine pregnancy has been excluded with certainty, a thing not easily done.

If an ovarian cyst is diagnosed during pregnancy treatment is based upon the decision as to whether the growth should be removed during pregnancy or after labor. Artificial interruption of pregnancy, which formerly was frequently advised, is at present rejected since it is well known that the prognosis of an operation during pregnancy is hardly more unfavorable than when this condition does not exist. The question is whether, according to the present status of operative interferences, abortion, that is, interruption of pregnancy during that period in which we can with some certainty expect to deliver a living child, is still to be seriously considered. Very recently this has been advised by Barner. Others advise resorting to this measure only in those rare cases of hard neoplasms and dermoid cysts which lie immovable in the small pelvis and would thus seriously interfere with labor. In such cases where the possibility of the passage of a full-developed child is considered impossible or at least very difficult, induction of labor toward the end of pregnancy is considered proper by some because of the greater probability that a living child will be born.

Löhlein, without contradicting the theoretic qualification of this question in general, considers the indication for premature labor only in a certain class of cases with complications of pregnancy, namely, when, aside from the ovarian cyst, severe symptoms due to other pathologic processes develop and which are entirely due to gestation, such as the nephritis of pregnancy complicated with an ovarian cyst. Such a complication of pregnancy would be an indication for artificial emptying of the uterus even without the presence of a cyst. Consequently, from

what has been said, it may be assumed that artificial premature labor has been abandoned in these cases. The reasons for this are apparent. In the first place, the prognosis of the fetus is always an uncertain matter, while, on the other hand, the mother is not relieved of her original trouble, the tumor, by merely emptying the uterus. The danger from the tumor, which is to be especially looked for in the postpartum, still remains, and sooner or later ovariectomy will be absolutely necessary.

Puncture of the cyst, which was so greatly advocated years ago, is to-day merely a matter of history, although a few writers have recently advised it for the relief of symptoms. It has probably been given up at the present time by the majority of operators, and rightly so, because in the first place, it does not cure the affection, as the cysts very rapidly refill, and also on account of the dangers, which are sometimes greater than abdominal incision. Infection of the cyst, which was formerly greatly feared, can, of course, be avoided by careful asepsis; but, on the other hand, injury to neighboring abdominal viscera, especially the gut, can often not be avoided, and therefore abdominal incision is to be greatly preferred even for diagnostic purposes. It should always be recalled that after a large cyst has been evacuated by trocar, hemorrhage, both intraabdominal as well as intracystic may arise, partly as the result of a direct injury to the larger vessels, partly as a result of a sudden diminution of the intraabdominal pressure. Torsion of the pedicle, due to the greater mobility of the growth after puncture, has also been observed, while escape of the cystic fluid into the abdominal cavity carrying along with it particles of the growth, when it has been a proliferating ovarian cyst, has resulted in the formation of metastases on the peritoneum. When in conclusion, one reflects that acute peritonitis may easily follow puncture of a suppurating cyst, there is reason enough to reject this procedure.

To my way of thinking, the only rational procedure is ovariectomy, and the favorable results which have been reported when this operation has been undertaken during pregnancy have conclusively demonstrated that gestation is no contraindication to the operation. I believe that this statement is generally admitted by all surgeons of any experience. Out of 266 cases the mortality was only 5.4 per cent. for the mother. As to the interruption of pregnancy due to the operation I find a percentage of 22.4 per cent. It is evident that a great number of cases, particularly the unfavorable ones, have never been reported,

and for this reason I merely submit the above figures for what they are worth without attributing to them any absolute value, but they certainly show that, as abdominal operations go, the prognosis should be considered very favorable, particularly for the mother and not so bad for the fetus.

If these figures are to be taken into serious consideration, it is necessary to weigh the question carefully whether in all cases where an ovarian tumor is found one should operate at once. The opinion that every ovarian growth found during pregnancy is an indication for immediate operation is, perhaps, most universally agreed to by operators. Since it has been pretty conclusively proven that the cases operated upon during the first few months of pregnancy usually go to term, it seems evident that an early operation should be undertaken, as the prognosis for the child is far better. If one recalls the causes which bring about uterine contraction after ovariectomy, it is not surprising to see that better results are obtained when the operation is undertaken in the early months of pregnancy. These are the mechanical irritation caused by the manipulation of the uterus and its adnexa, and the sudden cooling of the peritoneal cavity, which relaxes the muscular structure of the uterus, resulting in expulsion of the fetus.

The preparation of the patient for the operation during the second half of pregnancy may, in itself, stimulate the uterus sufficiently to cause a miscarriage. Then, again, during the operation, the uterus towards the end of pregnancy would bulge into the abdominal incision and has to be manipulated far more in order to get it out of the way so as to reach the growth. It may be, too, that the sudden cooling of the peritoneal cavity may have a different effect upon a much enlarged uterus, especially when the organ has been manipulated considerably in order to reach the tumor. The irritation produced from the lowering of the temperature should not be underrated, as it is well known that the application of cold to the abdomen is often resorted to in cases of postpartum hemorrhage in order to cause the uterus to contract.

It is quite evident that the favorable results obtained during the first few months of pregnancy are not merely accidental, and, what is more, under certain conditions, a timely ovariectomy may even prevent a threatened miscarriage, several instances of which have been reported.

Advising an operation as soon as possible in cases of ovarian

tumor during pregnancy, in order to avoid the complications which may occur during labor, pregnancy or postpartum seems to me justified. It is unnecessary to discuss the need of operation in those instances where the growth gives rise to very troublesome symptoms, as well as for those tumors lying in the small pelvis which may seriously interfere with the progress of labor. In those cases, however, where the growth has not caused any symptoms, and where, in all probability, they need not be feared, it might be of interest to the child to temporize, provided that there are no evidences of the growth being malignant. Fehling prefers to temporize in cases of first pregnancy or where the women have had few children with the hope of obtaining a viable infant.

However, the difficult point in these cases is to decide what shall be done when the patient is first seen during the middle of pregnancy, because it seems a pretty well-settled matter that when operation is done at this time miscarriage is more frequent. Therefore, under these circumstances, if no serious symptoms are manifest, operation may be deferred as long as possible.

At the end of pregnancy ovariectomy is the least serious, because the prognosis for the child is good, and even if it is undertaken during the ninth month and labor follows immediately upon the operation, it is probable that a living child may be born, provided that other conditions are favorable. As far as the mother is concerned, it is evident that by the removal of the tumor the complications resulting from it are removed.

It would appear that there are no special difficulties to be expected during labor, because many instances have shown that even during the period of expulsion the abdominal wound is not disturbed. However, if labor occurs before the patient has fully recovered from the effects of the anesthetic, one should be prepared for a rather profuse hemorrhage during expulsion of the placenta. For this reason it is perhaps preferable to remove the placenta manually as soon as the child has been extracted.

Bilateral ovariectomy has also been done during pregnancy, and it would appear that this interference is practically no more serious than when disease exists on one side only. Under these circumstances, however, an early operation is more imperatively called for, because when bilateral growths exist they not infrequently are of a malignant nature. Premature labor does not occur, apparently, with any greater frequency in these cases because the operation does not usually present any more diffi-

culty than when one ovary is alone the seat of the trouble. It has been stated that, after bilateral ovariectomy, more serious hemorrhage occurs during labor and the postpartum on account of the effect of castration on the uterine mucosa, but I merely mention this fact and make no comment on it, having had no personal experience in the matter. I would, however, say that the relationship, as yet insufficiently understood, between the ovaries and the non-pregnant uterus in its normal condition, can also be applied to the pregnant uterus, and since it is generally admitted that during gestation ovarian activity ceases it may quite properly be assumed that when, after ovariectomy interruption of pregnancy occurs, this is due to the direct irritant action of the operation on the uterus.

871 BEACON STREET.

VINCENT'S ANGINA DURING PREGNANCY.*

A CASE REPORT WITH BACTERIOLOGICAL STUDIES AND AUTOPSY
FINDINGS.†

BY

FRANKLIN ROYER, M. D.,
Philadelphia, Pa.,

Formerly Chief Resident Physician, Municipal Hospital.

VINCENT'S ANGINA is a term used in modern medical nosology to include a series of lesions of the mucous membrane and skin about the throat and mouth believed to have a common etiology. By almost universal consent, the term "Vincent's angina" has been applied to these lesions because the description used by him of the spirilliform organisms associated with fusiform bacilli was so clear and followed so soon after his demonstration, that the work of Bernheim who demonstrated these organisms several months earlier, of Bernheim and Pospischill who first described these organisms in ulcero-membranous stomatitis, and of Plaut who reported spirilli in five cases of noma have been largely overlooked by the profession, and the work of Seiffert and others has only recently been recalled by Weaver and Tunnicliff.

In the ten years that have elapsed since these organisms were first found in tissue and smear preparations in ulcero-membranous sore throat, many case reports have been written and several review articles on this subject have been published. The most noteworthy articles from a scientific stand-point are those of

* Paper read before the Philadelphia County Medical Society, October 13, 1908.

† From the case records and laboratory records of the Municipal Hospital.

Herman, of New York, and the larger review of Weaver and Tunnicliffe, of Chicago; the later article including a summary of the literature of noma and such gangrenous and ulcerous mucous membrane and skin lesion as might be grouped under one heading because of having a common set of organisms constantly associated in the lesion and believed by many to be the causative agent.

The reason for delay until 1897 and 1898 in finding this association of interesting organisms is that modern culture methods practically fail to grow this particular group of bacteria. The investigator has often studied by bacteriologic cultures noma, gangrenous stomatitis and hospital gangrene with disappointing and inconstant results.

Careful staining of smear preparations made from the site of this disease using, preferably, a solution of carbol-fuchsin, methylene blue or one of the azure preparations will show with great uniformity the spirilliform bodies and the fusiform bacilli now generally accepted as being the cause of these lesions. Careful staining of sections of tissue going through this membranous or gangrenous area will show that the spirilliform threads extend even beyond the lesion and into practically normal tissue. Cultural methods except, possibly, anaerobic technic, fail to secure growths of these germs, hence complete proof as to the cause is lacking. Koch's circuit cannot be fulfilled until newer methods satisfy his conclusions.

Enough work has been done, however, to justify our accepting this organism as the probable cause of all membranous, ulcerous and gangrenous lesions of the mucous membrane and of the skin in which this group of bacteria is found constantly associated.

We certainly are justified in looking for a broad clinical term which will include all these lesions, whether they be on skin surface or mucous membrane and whether they be membranous, ulcerous or gangrenous. Until such time comes we must be content, in speaking broadly, to use the term Vincent's angina for the mucous membrane lesions and noma for the gangrenous skin lesions showing these organisms.

The fatal illness which we are about to detail began as an exudative or pseudomembranous tonsilitis and remained localized for six days or until labor began. It spread rapidly as a membranous process and showed slight ulceration when the membrane was removed on coming under my care. The lesions extended rapidly and became generally gangrenous and widely destructive later. The disease did not act like true diphtheria,

nor was the pseudomembrane characteristic of diphtheria except in certain areas. A provisional diagnosis of Vincent's angina was easily confirmed by studying the smear preparation.

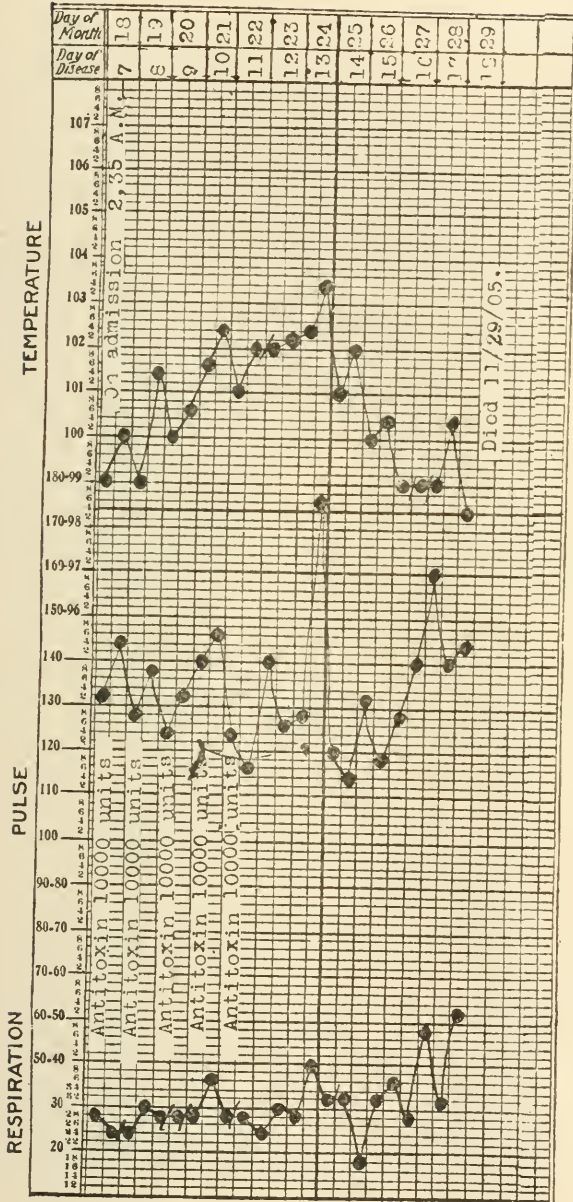
The history is as follows:

Name, E. B. Age, twenty years, unmarried. Admitted from the service of Dr. John C. Hirst, Maternity Hospital, Tenth and Fitzwater Streets. She had rheumatism and measles in early life, talipes varus since birth, both feet being badly involved. No other history of disease.

Patient admitted to my care in the Municipal Hospital, November 17, 1905, after a premature labor at eight months. Labor induced because of contracted pelvis. Slight laceration sustained.

History of the Disease.—Illness began November 11, 1905, with angina in the form of follicular tonsillitis, the condition not becoming serious until November 16, the day of labor. On admission the patient was very greatly prostrated; eyes and ears clean; tongue heavily coated; breath very foul. A strip of pseudomembrane two to three centimeters wide is seen inside each cheek extending along the buccal mucous membrane from a point opposite the first molar tooth to the angle of the jaw and across the mucous membrane in front of the articulation to the anterior pillar, becoming continuous with the membranous-like material on the tonsils and uvula. A similar strip of pseudomembrane is noted on the under surface of the tongue on each side of the frenum. This pseudomembrane is pultaceous-looking, friable and thick, presenting an appearance of having been piled up in layers. Both tonsils are well covered with an exudate and a part of each side of the uvula shows involvement. The color of the pseudomembrane is pearly-white or grayish-white. The involvement of the uvula and upper portion of each tonsil looks clinically like diphtheria, the other areas do not bear this resemblance and when the pseudomembrane is removed shows beginning gangrene of the mucous membrane. The nostrils are apparently not involved. Pulmonary resonance good, apex beat of heart diffuse, sounds of fair tone. Anterior and posterior cervical glands are considerably enlarged. There is marked cellulitis of the tissues external to the tonsils and beneath the jaw. Skin is free from eruption. Patient was given 10,000 units of diphtheria antitoxin on admission, at 2 A. M.; it was repeated at 11.30 A. M.; and again on November 19, 20 and 21.

A total of 50,000 units of antitoxin was given in the Municipal



Temperature, pulse and respiration curves while under my care. Diphtheria antitoxin was administered in as large a dose as would have been employed in true diphtheria.

Hospital. She had previously been given 3,000 units at the Maternity Hospital.

Smears and cultures carefully taken November 18 and 19 from the tonsils, from the uvula, from beneath the tongue and from the buccal mucous membrane showed no Klebs-Loeffler organisms. On the 19th, cultures taken from the right tonsil did show diphtheria organisms; on the 21st, cultures and smears were negative for diphtheria bacilli; on the 24th, however, positive diphtheria cultures were obtained from both the right and left tonsils and from the buccal mucous membrane. The virulence of these organisms was not tested.

The following are additional laboratory notes by Dr. E. Burvill-Holmes:

November 18, 1905, smears from the throat, stained, respectively, with Loeffler's methylene blue and methylene azure, do not show Klebs-Loeffler bacilli. Smears from the necrotic area under the tongue and from the necrotic area of the cheek do not show the diphtheria organism. Wright's stain reveals innumerable spirilli and methylene azure and Loeffler's blue the presence of fusiform bacilli.

BLOOD ESTIMATION.

Leukocyte count,	43,000 per cm.
Erythrocytes,	2,476,000 per cm.
Hemoglobin,	not estimated

DIFFERENTIAL COUNT.

Polynuclear neutrophiles,	87.9 per cent.
Large lymphocytes,	6.0 per cent.
Small lymphocytes,	6 per cent.
Eosinophiles,	2.6 per cent.
Normoblasts,	4 per cent.
Myelocytes,	4.4 per cent.
Basophiles,	.05 per cent.

No poikilocytosis and all red cells stain evenly throughout. Iodophilia reaction slight.

Patient's condition was decidedly worse on the 19th and marked gangrene was seen on both sides of the inferior surface of the tongue on the buccal mucous membrane and tonsils and along the alveoli of both jaws; all teeth loosening rapidly. Chloroform was administered, all the necrotic areas removed with curet, all teeth were extracted, the thermo-cautery was liberally

applied at black heat to the gangrenous areas of tongue, cheek, alveoli, tonsil and uvula. After operation, the mouth and throat were frequently irrigated with potassium permanganate solution, and stimulants were freely administered. On the 20th, a severe glossitis was noted. At this time strips of thick pseudomembrane covered in good part the cauterized gangrenous areas. Sloughing of tissues extended beyond the points cauterized. The patient at this time was able to take little nourishment by mouth; so rectal feeding was instituted. On the 22d, the oral condition was slightly improved, and some liquids were swallowed; an area of flatness and distant breath sounds were discovered in the posterior left lung extending toward the axilla. The pulmonary impairment extended, and by the 24th instant the patient had all signs of a septic pneumonia developing. From this time until the 28th, the day of death, the mouth condition remained exceedingly foul; the pseudomembrane slowly disappeared, the necrosis lessening considerably. Her strength, however, gradually decreased; little nourishment could be administered by mouth, the rectum became irritable and she died from the exhaustion of septic pneumonia on the seventeenth day of illness.

This case is of particular interest in that the condition first thought to be diphtheria developed during the eighth month of pregnancy in an institution where no diphtheria was present. The disease should be called malignant membranous angina (Vincent's angina) showing as it did in smear preparations Vincent's spirillum and a fusiform bacillus and only later by culture diphtheria-like organisms. It is worthy of note, however, that she was treated in the diphtheria hospital and the diphtheria germs may have been contaminations from the hospital atmosphere she was breathing. Virulent diphtheria organisms were recovered at autopsy from the lungs.

The following autopsy notes by Dr. E. Burvill-Holmes are appended as worthy perusal.

The body of a somewhat emaciated female. Rigor mortis is present. Very slight cadaveric lividity. At the bend of the right elbow is a bluish discolored area, about 3 cm. by 1 cm., in the center is a small punctured wound. This is said to be the site of a blood culture. Both feet present the condition of talipes varus. External genitalia, to the exclusion of the perineum which shows evidence of recent rupture repaired by sutures, are normal.

The mouth contains considerable brown, foul-smelling fluid. When wiped dry, a strip of gangrene is noted on the inferior buccal membrane near the gingival margin on each side, about two centimeters wide, extending from a point opposite the first molar tooth to the anterior pillar of each tonsil. Both tonsils are gangrenous, as is also the uvula. On the under surface of the tongue on each side of the frenum is a strip of gangrene two and a half centimeters wide and about twelve centimeters long.

There is a small quantity of subcutaneous abdominal fat. Muscles are apparently of good color and texture. Intestines are in their normal relation and the vermiform appendix is apparently normal. The peritoneum is moist and the peritoneal cavity contains no free fluid.

The per cardiacal cavity contains about 5 c.c. of fluid, the pericardium is normal. The heart as it lies *in situ* appears somewhat enlarged, particularly on the right side, and is normal in color. On section, the right auricle is found to contain a large chicken-fat clot. One is also present in the right ventricle and extends into the pulmonary artery. The cavity of the right auricle is larger than normal, as is also that of the right ventricle. The foramen ovale is not patulous. The valves at the pulmonary orifice and also the tricuspid are apparently normal. On the anterior cusp of the mitral valves in the middle at the site of the corpus aurantii is a smooth yellow nodular enlargement. It feels cartilaginous and looks like an abnormally enlarged corpus aurantii. The intima of the large vessels are apparently normal. Coronary arteries are normal. The muscularis is of good color and firm.

The pleural cavities contain no fluid, and there are no adhesions between the parietal and visceral pleurae anywhere. The upper and middle lobes of the right lung collapse when the thorax is opened, as does also the lower lobe. The former are of pinkish color, while the latter is of a dark reddish-brown hue. The lung seems to crepitate everywhere, but the lower lobe has a somewhat more boggy feel. On section, the upper lobe shows at the apex a cavity three centimeters by one centimeter, composed of broken-down softened lung tissue. The material is of a greenish-yellow color and has a foul odor. The remainder of this lobe exudes a large quantity of frothy mucus. The lower lobe is extremely friable, portions of the organ being readily broken off, and it is with ease that the finger can be thrust through it. The surface is distinctly granular and each lobule can be easily identified.

The entire lobe sinks readily in water. The peribronchial glands are markedly enlarged. On section, they show no caseation or other gross change.

The spleen is larger than usual and paler than normal; particularly on section; it being of a pale pink color. It is soft.

The liver is slightly larger than normal. Its surface is smooth and edges are round and regular; in color it is pale brown. On section, much blood exudes and the tissues distinctly pale and somewhat soft.

The pancreas is apparently normal.

The adrenals show nothing abnormal.

The right kidney is smaller than normal, it feels tough, the capsule strips with some difficulty, some portions of the organ being pulled away with it. Its surface is rough, granular and mottled. On section, the cortex is much diminished in size. It is whitish in color and appears to be fibrous. The pyramids are not distinctly outlined. The left kidney presents essentially the same appearance as its fellow.

The stomach and intestines are apparently normal.

The uterus is larger than normal, projecting upward almost to the pelvic brim. On section, the endometrium is much congested and a good deal of blood exudes. Over the anterior surface of the endometrium are a large number of hard, blackish, vegetative-like growths. These are removed with difficulty, and on section are distinctly fibrous.

The bladder contains about twenty-five cubic centimeters of urine; the organ presenting nothing abnormal.

Pathological diagnosis:

Gangrenous stomatitis, gingivitis, uvulitis and tonsillitis; edema of the lungs, hypostatic congestion, pulmonary tuberculosis with gangrenous area of left lung; lobular pneumonia; dilatation of the right heart; cloudy swelling of the liver and spleen; chronic diffuse nephritis, and endometritis. Smears of the caseous material from the apex of the left lung show many bacilli of tuberculosis.

Further bacteriological notes: Cultures taken at autopsy from the heart, spleen and liver remained sterile. Cultures from the right and left lungs showed the Klebs-Loeffler bacillus, and from the left lung the bacillus pyocyaneus.

Culturally, the organisms secured from the lungs at autopsy proved to be the Klebs-Loeffler bacilli. Their virulence was established by the fatal result in thirty-three hours of one cubic

centimeter of twenty-four-hour bouillon culture inoculated subcutaneously into a guinea-pig weighing two hundred and thirty-eight grams.

I fancy this report is incidental to the hospital surroundings, and without other proof would be inclined to look upon the laboratory finding during life as the diphtheria-like bacillus so often found in these cases, and so well proven to be other than the Klebs-Loeffler organism by Dr. Randle C. Rosenberger.

The primary history and bedside notes were written by Dr. Joseph F. O'Neill, my assistant in charge of the diphtheria division of the Municipal Hospital, and the laboratory notes by Dr. E. Burvill-Holmes, my first assistant in charge of the laboratory division.

A full bibliography of this interesting disease is given with Weaver and Tunnicliff's article in the January number of the *Journal of Infectious Diseases*.

35 SOUTH NINETEENTH STREET.

REPORT OF A CASE OF ICHTHYOSIS FETALIS; PLACENTA AND MEMBRANES INVOLVED.

BY

H. R. COSTON, M. D.,

Birmingham, Alabama.

Obstetrician to Hillman Hospital and the Rescue Home; Visiting Physician to the Mercy Home for Children.

(With two illustrations.)

ICHTHYOSIS FETALIS.—Harlequin disease of English writers—is an exceedingly rare condition. According to Fischer there had been only 42 cases reported in literature up to 1895. I have not had access to the *Index Medicus*, but through the various year books I have been enabled to find reference to but two other cases, and I am not sure that these were not included in the statistics given by him as both were reported during the year 1895—one in the *New York Medical Record* and the other in the *British Medical Journal*.

According to Graham¹ it was described by Avicenna under the heading of "Abaras nigra." He also credits Willan as having given the first accurate description of the disease.

Gould and Pyle² enumerate many cases of ichthyosis, but usually these are cases appearing after birth.

Etiology.—Concerning the causes of ichthyosis but little is definitely known. The weight of authority is on the side of he-

reditary, but certainly in my case such was not true as both husband and wife were each one of eleven brothers and sisters—twenty-two children in all—and in none of these had there ever been any form of skin trouble known. I questioned the parents of both husband and wife and neither knew or had ever heard of any kind of skin trouble existing in any member of a large family connection. Galewshy³ quotes Reyer as having reported cases running through six generations.

Mracek⁴ says it is hereditary. Kerr⁵ says it is always hereditary, while on the other hand Edgar⁶ says there is no family predisposition. Shoemaker⁷ takes a more middle ground and says it is strongly hereditary, but there are many cases in which hereditary cannot be traced. Leloir⁸ classes it with the dermatoneurosis,



FIG. 1.

and Leloir says various clinical observations justify a belief in its nervous origin and quotes Charcot as looking upon it as a trophic trouble secondary to peripheral or central nerve lesions. No authority that I have been able to consult attributes it to any morbid, systemic condition. Shoemaker⁹ says the parents are devoid of any constitutional taint, and Taylor¹⁰ also says it is no indication of a systemic, morbid state of either parent. It more often attacks the male than the female; my case was a female.

Time of Development. Rotch¹¹ quotes Ballentyne as saying it may develop as early as the fourth month of gestation. Dorland¹² says it probably develops at the close of the third or during the fourth month.

Prognosis.—D. H. Fox says the unborn child with a severe form of ichthyosis is usually still-born, and if born living is only

capable of living a short time. However, Cabot¹³ relates a case born at the seventh month which lived to be fifteen months old. Holt¹⁴ relates a case of congenital ichthyosis in which exfoliation occurred every two or three months for the first ten month of the child's life. More often the child is born with only a small spot which gradually spreads over the body. Neptune¹⁵ reports a child born with a spot the size of a thumb-nail midway between the knee and ankle which gradually spread over the entire body. Cases with only a limited surface involved may survive but one with a generalized ichthyosis would almost inevitably perish in a few days, or weeks at most.



.FIG. 2.

CASE.—Mrs. L., *æt.* 17, first pregnancy, born and reared far out in the country; always well and accustomed to do such work as people living on a farm find necessary, milking, cooking, washing and general housekeeping. She is one of eleven children by the same parents, all living and healthy. The husband, *æt.* 21, was reared in the same locality and worked on the farm since boyhood. He is also one of eleven children and all are living and in perfect health. Both husband and wife are quite intelligent and fairly well educated. In each family twins were of frequent occurrence. These two young people were married December 25, 1907, and immediately removed to this city; both have clean morals and neither had ever had any serious illness of any kind.

Mrs. L. began menstruating December 29, it lasting five days. This was the last menstruation. First fetal movement felt about May 15. I was called June 19 because of a free, serosanguinolent discharge of several days duration but unaccompanied with pain. The woman was in perfect health with the exception of this discharge. The uterus was so fully developed that I supposed her to be at least seven months pregnant but upon inquiry obtained the foregoing history. The fundus reached

well up to the costal margin, especially on the right. Fetal heart sound audible in left iliac space. Uterine souffle unusually loud in right hypochondriac space and also heard very distinctly in lower left iliac space. I made a tentative diagnosis of twins because of the great distention of the uterus and because of the family history; also a diagnosis of possible lateral prævia of one placenta because of the discharge, and also because of the souffle heard in the left iliac region. I kept her in bed and used sedatives (Elix. Viburn, op. Co. N. F. and Bromides) but on the twenty-fourth—five days after the first call—she had quite a serious hemorrhage but no pain. I tamponed very tightly with aseptic gauze which was left in place thirty hours. As there was no pain and no evidence of further hemorrhage the tampon was removed the sixth day from first call. Upon removal no dilatation was found, but the cervix was obliterated, and eighteen hours later labor came on and in a few hours was completed without further incident. The child presented by the breech in right oblique diameter with sacrum anterior. The membranes were preserved intact until the breech was passing the vulva when they ruptured spontaneously, and the delivery was completed almost instantly. The fetus made feeble attempts to breathe. As the fetal limbs dropped into my hands I noted the rough feel and scaly condition. The placenta followed immediately—indeed, a considerable portion was extruded along with the head, having been torn off by its advance. Such a quantity of placental tissue I have never seen at full term, even in case of twins. It filled an ordinary chamber two-thirds full. This case, remember, could scarcely have been more than five and one-half months advanced. I call particular attention to this enormous mass of placental tissue, which accounted for the abnormal distention of the uterus and also for the hemorrhage preceding labor. Upon the surface of the amnion and umbilical cord many ichthyotic patches were easily found, and the amnion was three or four times as thick as in the normal state. The placenta measured three and one-half inches in thickness at its thickest portion and extended from the fundus almost to the internal os uteri, or from the costal margin to the pelvic brim—about ten inches—was exceedingly friable, so that it was difficult to handle without tearing it. I regret not having weighed it in its fresh state. The normal placenta averages about one inch in thickness and weighs about one pound. This one now weighs one and a half pounds after having been well drained and many small portions torn off. The photographs give a very accurate idea of the condition presented by the fetus; it is covered from head to foot—except flexures, the eye-lids, a small portion of the nose and the ano-genital region—with rough scales separated by fissures. As Cotton¹⁶ expresses it, it “looked as if it might have been hide-bound and the uniform development caused a general breaking up of the epidermis with subsequent development of crusts.” The feet and hands are much thicker—

clubbed—than normal, the eyes are not equally developed and, as may be seen in the figure, the nose shows some deformity.

Hyde¹⁷ says: "As a rule, these monsters exhibit marked cranial defects, ectropion, and grave deformities of the eyes, ears, mouth and ano-genital region."

The ano-genital region in my specimen is apparently normal but neither eyes, ears, nose or mouth would be pronounced normal. The fetus showed considerable rigidity immediately after its birth, due to the thickened condition of the skin.

The photos show something of the size of the placenta as it rises behind the child in the picture. The resemblance to the skin of a fish was so great that the woman's father, who was present at the birth of this case, immediately questioned her about having been visiting fish markets or had she "had unsatisfied cravings" for fish, etc., thus illustrating the popular belief of "marking," as well as the propriety of the name of the disease, ichthyosis—from *ichthus*—a fish.

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- 417 FIRST NATIONAL BANK BUILDING.

THE CAUSES OF ABORTION.

AN ATTEMPT TO CLASSIFY THEM ON A PHYSIOLOGICAL BASIS.

BY

FRED J. TAUSSIG, M. D.,

St. Louis, Mo.

IN text-books and monographs the causes of abortion are usually considered in a very unsystematic and illogical way. Some consider them in the order of their frequency (syphilis, endometritis, trauma). Others divide them into maternal, paternal and ovular causes. In fact, there is usually a tendency to group the causes as if abortion were an abnormality in the development

of the ovum, whereas it is really an abnormality of the pregnant uterus.

Abortion is but a slight variation of a physiological action of the uterus. The only difference between it and normal labor is the fact that it occurs during the first half of pregnancy, whereas labor sets in at the termination of pregnancy. We should not confuse the various conditions that cause the death of the fetus with those that cause abortion. They are separate entities with a special etiology.

While in general the causes of abortion are those stimuli or irritants that stir up premature uterine contractions in the gravid uterus, we must differentiate between conditions of the uterus which predispose to such an expulsion of the ovum (predisposing causes) and conditions which directly excite the uterus to get rid of its contents (exciting causes).

Of the *predisposing* causes of abortion we may have:

1. Increased sensitiveness to nerve stimulation.
 - a. Temperament.
 - b. Frequent abortions at rapid intervals.
 - c. Menstrual period.
2. Greater tendency to placental thrombosis due—
 - a. To endometritis
 - b. To congestion of the uterus, under which head may be mentioned constipation and coitus.
3. Lessened resistance to expulsion.
 - a. Cervical tears.
 - b. Amputation of cervix.

It is necessary to consider thus separately the predisposing causes of abortion, since the slightest sort of mechanical or other irritation may in susceptible individuals cause a miscarriage, whereas in persons not so predisposed they would have had absolutely no effect. The predisposing causes mentioned in this classification are undoubtedly a factor in many instances, but they are of secondary importance to a consideration of the primary exciting causes.

These are:

1. Mechanical irritation.
2. Thermic irritation.
3. Toxic irritation.
4. Nerve irritation.
5. Death of the fetus.

Of these five stimuli to uterine contractions, that of fetal death demands a word of explanation. It is grouped separately, partly because of its great importance, partly because the manner in which fetal death sets up uterine contractions is not thoroughly understood. It seems likely, however, that by partial separation of the placenta in these cases the ovum becomes, so to speak, a foreign body in the uterus and the uterine muscle is, therefore, stimulated to expel it. In this sense we might include death of the fetus under the head of mechanical irritation applied to the inside of the uterus.

It will, however, strike the reader that the classification suggested in this article requires the consideration of certain diseases and conditions under several of the five heads already mentioned. Thus, for instance, cholera of the mother might act either as a toxic irritant, as a mechanical irritation to the mucosa of the uterus by the formation of hemorrhagic exudates or by causing the death of the fetus. A further objection to any classification would also be the fact that in many instances we know that certain conditions are frequently associated with abortions, but do not know the manner in which they produce them. While I willingly grant that what we do not know concerning the causes of abortion is far greater than what we do know, I believe that a logical, and hence in this case a physiological, classification is the only one that will ever create order out of the present chaos and put us in the way of finding out the causes of abortion in general and its cause in any particular case under consideration. Corollary thereto is, of course, the fact that the prevention of abortion depends primarily on a correct understanding and appreciation of the causes.

Let us now try to systematize the exciting causes under their five main subheads.

MECHANICAL IRRITATION.

This may take the form of—

- a. Transmitted irritation.
 - b. Direct irritation.
- a. *Transmitted mechanical irritation* is that in which the uterus is not directly touched in any way. Thus we may have
1. A blow.
 2. A fall.
 3. A prolonged jarring, as in horseback riding, dancing or a railroad journey.

4. Straining, as in lifting heavy objects or when the bowels are constipated.

b. *Direct irritation* may be applied to—

1. The outside of the uterus.
2. The inside of the uterus.

That applied to the outside may result from traction or pressure as when there are adhesions to the uterus, where there is a mal-position crowding it into a corner of the pelvis, or where tumors of one sort or another impinge upon its growth upward into the abdominal cavity. Furthermore, outside irritation may be due to direct manipulation, as in case of a laparotomy for appendicitis, ovarian tumor, etc., or to the almost direct manipulation employed in a bimanual abdominovaginal examination.

Direct irritation to the inside of the uterus may be due to stretching (as in acute hydramnios); to direct instrumentation, as when a sound, bougie, gauze or other foreign object is applied to its interior; to the irritation of an exudate or hemorrhage into the endometrium arising, as is not rarely the case in certain infectious fevers; and to intrauterine tumors as in fibroid polyp.

THERMIC IRRITATION.

This may be in the form of extreme heat or extreme cold, either of which, as is well known, will stimulate the uterine muscle to contraction. This form of uterine irritation is, however, not so frequently a cause of abortion. It may be applied to the entire body or to the uterus alone. As an example of the former class of cases, we might mention the taking of cold sea baths. As an illustration of the latter is the hot vaginal douche or the hot-water bag. We also hear of patients who, after an absence of menstruation for six weeks, take a hot sitz-bath and thereby bring on a bleeding which they think is the normal menstruation, but which not so rarely is really an early abortion.

TOXIC IRRITATION.

This may be of three kinds:

- a. *Chemical toxins.*
- b. *Bacteria' toxins.*
- c. *Placental toxins.*

The *chemical toxins* may be certain drugs called emmenagogues which seem to have a direct influence upon the uterine muscle. They are primarily ergot and its associated compounds, hydrastis, stypticin, etc. The by-products of diabetic metabolism,

the chemical substances circulating in the blood in chronic lead-poisoning, and the various conditions productive of a greatly increased amount of carbonic acid gas or an insufficient oxygenization of the blood, all may be classed under this head of chemical toxic irritation. An illustration of the way in which an excess of carbonic acid gas in the blood is productive of abortion is given by Thomas. He relates the story of an Arab tribe who, being pursued by their enemies, were compelled to take shelter with their wives and children in a subterranean cave. Here they remained for several weeks nearly suffocating from lack of fresh air. A very large percentage of the women who were pregnant at the time aborted during this trying period.

A very high fever is productive of uterine contractions owing to the accumulation of carbon dioxide gas in the blood. Heart disease in the stage of incompetency and certain diseases of the lungs have a similar effect.

Bacterial Toxins.—There can be no question but that many infectious diseases of the mother, such as small-pox, measles, etc., stimulate the uterus to contraction, owing, to the toxins circulating in the blood.

Placental Toxins.—We have now learned to consider chorea, hyperemesis, eclampsia and acute yellow atrophy as essentially similar conditions due to placental toxemia. Any one of the four, but hyperemesis in particular, may give rise to an abortion.

NERVE IRRITATION.

Nerve irritation of the uterus producing abortion may be classed under two heads—*psychic* and *reflex*.

Psychic nerve irritation is not an infrequent source of abortion, but yet does not occur as often as many women believe. Just as in the case of maternal impressions, the explanation follows the occurrence of the deformity, so in the case of abortions mothers are apt to attribute the cause to some external mental excitement, when in reality the premature expulsion was due primarily to the death of the fetus. As instances of psychic nerve irritation can be mentioned fright, mental shock of any kind, severe pain, as in the extraction of a tooth.

Reflex nerve irritation is in all likelihood transmitted along the sympathetic system. Although we really know very little about such reflexes, it would appear from clinical observation that they do occur. The nursing mother who, despite the fact that she is nursing her child, has become pregnant is often first

led to think of such a possibility by the fact that whenever she nurses her child it starts up uterine contractions and occasionally a slight bloody discharge. Applications made to the nose have also been known to cause abortion.

Finally, every gynecologist has learned from experience that operative measures or even to a certain extent local treatment applied to the external genitals is attended with such great risk of causing an abortion that whenever the measures necessary are rather severe it is deemed advisable to wait with treatment until after pregnancy is concluded.

DEATH OF THE FETUS.

Death of the fetus would seem to be the most frequent cause of abortion, just as it is the most difficult to avoid. I have subdivided this branch into five heads:

- a. *Congenital inanition.*
- b. *Congenital deformities*
- c. *Interference with nutrition.*
- d. *Infections.*
- e. *Hyperpyrexia.*

a. *Congenital Inanition.*—Death of the fetus may be due to conditions preceding or shortly subsequent to the impregnation of the ovum. The general physical condition of the father, together with the effect of wasting diseases, alcoholism or of too frequent coitus, may result in a lowered vitality of the spermatozoon, so that while impregnation may take place and the ovum even become imbedded in the uterine mucosa, its life is soon cut short and an abortion results in the course of time. In a similar way the ova of the mother may be congenitally so weak as to interfere with development.

b. *Congenital Deformities.*—The percentage of monstrosities in the ova of abortion is very considerable. Of course, the monstrosity must be of such a character that it directly interferes with the life of the fetus, otherwise development would continue. The cause of the monstrosity may be either primary in the ovum or secondarily due to amniotic adhesions. It seems not unlikely that these adhesions form during the first months of pregnancy before the amniotic cavity has become distended with fluid.

c. *Interference with Nutrition.*—The nutrition of the embryo may be interfered with by—

1. Maternal,
2. Placental or
3. Umbilical causes.

On the part of the mother, anemia, tuberculosis or similar condition may so interfere with her own nutrition that that of the fetus is necessarily likewise affected and occasionally results in its death.

The placenta, the most important organ in fetal metabolism is not rarely the site of infectious and degenerative processes. These, by the formation of necrotic areas of organized hematomata, or by that peculiar proliferation of the fetal epithelium known as hydatid mole formation, limits of necessity the surface area of blood aeration and the absorption of nutritive material from the mother. Whenever such placental thrombosis or degeneration involves a greater part of the placenta, death of the fetus is almost sure to result.

Finally, we have interference with fetal nutrition due to an obstruction in umbilical circulation. Such obstruction may be in the form either of a true knot or, in younger embryos, of a twist through several circles of the umbilical cord. Amniotic adhesions may also cause a constriction of the cord with death of the fetus.

d. *Infectious Diseases of the Fetus.*—Infectious diseases of the fetus are probably the most frequent cause of abortions since we include under that head fetal syphilis. The great universality of this disease together with the frequency with which it is transmitted to the fetus, thereby producing fetal death and abortion, has led not infrequently to the diagnosis of syphilis merely by the fact that a woman has thus frequently aborted. Even where there are no past or present manifestations of the disease, many believe that antisyphilitic treatment should be tried in cases of repeated abortion and the results of such treatment would seem to support the view that syphilis may thus covertly attack the fetus without in any way affecting the mother.

Other infectious diseases of the fetus are directly transmitted through the placenta from the mother to the fetus. They are small-pox, cholera, anthrax, plague, typhoid, erysipelas, scarlet fever, pneumonia and tuberculosis.

Hyperpyrexia.—It has been mentioned that a high fever may cause toxic irritation of the uterus by the accumulation of carbon dioxide gas in the blood. When we realize the fact that the temperature of the fetus within the uterine cavity has been proven

to be approximately one degree higher than that of the mother and likewise take into consideration its lesser vitality, it is not surprising that a high fever, even for a short period of time, may result in the death of the fetus.

SUMMARY OF CLASSIFICATION.

Predisposing Causes:

1. Increased sensitiveness to nerve irritation (temperament, frequent abortions, menstrual period).
2. Greater tendency to placental thrombosis (inflammation of endometrium, congestion).
3. Lessened resistance to expulsion (cervical tears or amputation).

Exciting Causes:

1. *Mechanical Irritation.*
 - a. Transmitted (blow, fall, dancing, railroad journey, lifting heavy objects, constipation).
 - b. Direct.
 - (1) To outside of uterus (adhesions, malposition, tumors, examination, laparotomy).
 - (2) To inside of uterus (instruments, hemorrhagic exudates, hydramnios, tumors).
2. *Thermic Irritation.*
 - a. General (sea bath).
 - b. Local (hot douche, sitz-bath).
3. *Toxic Irritation.*
 - a. Chemical toxins (ergot, carbon dioxide, lead-poisoning).
 - b. Bacterial toxins (maternal small-pox, measles etc.).
 - c. Placental toxins (hyperemesis, chorea, eclampsia).
4. *Nerve Irritation.*
 - a. Psychic (fright, pain, shock).
 - b. Reflex (external genitals, breast, nose).
5. *Death of the Fetus.*
 - a. Congenital inanition (illness of parents, alcoholism, too frequent coitus).
 - b. Congenital deformities (primary in ovum, amniotic adhesions).
 - c. Interference with nutrition.
 - (1) Maternal (anemia, tuberculosis).
 - (2) Placental (mole degeneration, thrombosis).

(3) Umbilical (twisted cord, true knot, constrictions).

d. Infectious diseases (syphilis, small-pox, typhoid, pneumonia, etc.).

e. Hyperpyrexia.

731 METROPOLITAN BUILDING.

CRIMINAL ABORTION.

ITS PREVALENCE, RESULTS AND TREATMENT.*

BY

FRANK H. JACKSON, M. D.,

Houlton, Maine.

IN an article entitled "The Scientific and Practical Value of Hospital Interneship," in the *Journal of the American Medical Association*, for May 2, 1908, by the late Nicholas Senn, the following sentence succinctly shows the high regard entertained by that famous surgeon for the profession he so greatly honored. "Of the three learned professions, medicine, law and theology, medicine is the one that preeminently requires the most careful preparation for practice, for the physician the moment he enters upon his life-work has to deal with human life—the most sacred thing on earth."

I have no apology to make for bringing the subject of criminal abortion to the attention of the members of this society, as it is one that is worthy of our most earnest thought and consideration. Since the dawn of the earliest civilization, its commission has justly been regarded as a crime; but in spite of both civil and ecclesiastic law, instead of being on the decrease, this most nefarious crime against society and the state is on the increase. It has become such a disgrace that the members of the county and State societies of Maine owe it not only to the State, but to themselves, at once to institute a vigorous campaign against the abortionist and drive him out of business. It will not do for this or any other organization to pass a few resolutions to put a stop to this outrageous practice and then allow the matter to drop, but it is our duty to drive out the abortionist as we are driving out the tubercle bacillus. If we are to retain our own respect and merit the honor and dignity due our profession, we must purge our ranks of the men who are daily disgracing it. I

* Read at the Maine Medical Association, Bangor, Maine, June 10 and 11, 1908.

purposely do not intend to consider in this paper the midwife who uses her calling to cover her true character, the scoundrel who in the daily press openly or covertly offers to do this work, but the man who, under the guise of an ethical practitioner, prostitutes his profession. As a balm to our conscience, we comfort ourselves with the thought that midwives and renegade physicians are the ones that are doing the most of this work, but such a fact does not obtain in the State of Maine, regret it as we may. To our disgrace the men who are performing most of the abortions in this State are not outcasts from their profession; some of them are members of this State society and its county branches, and as a shield for their rottenness they are sometimes seemingly earnest workers in our church and social life; they are often pointed out as honest, hard-working physicians, yet some of them will kill a baby in its mother's womb with as much compassion as the butcher in the abattoir performs his daily work on the killing-floor. Putting it at a conservative estimate, I believe that there are performed fifty thousand abortions annually in this State. Fifty thousand murders, yet the perpetrators are enjoying their freedom. For the sake of a few paltry dollars, they will destroy a potential human life, and with a hellish spirit of nonchalance condemn a woman to the danger of a horrible death from puerperal sepsis or a life of chronic invalidism.

According to the great criminologist, Lombroso, abortion in the United States has become so common that, instead of being regarded as a crime, it is a laudable and justifiable means of limiting the size of families. Such a statement coming from so eminent an authority causes the student of this vital question to stop and ask how can such a thing be? What power is it behind the throne, in this or any other State, that is preventing the bringing of these men to justice? We should hang our heads in shame at the thought that it is practically impossible to convict these men in our courts when for almost any other crime with half the proof they would be speedily given a prison sentence. With all due respect to the judiciary of the State of Maine, I ask why a man who has destroyed two human beings should receive only three years in our State prison, while a tramp who stole a few dollars should get five? No man who has been in practice for more than a few months but has been asked by some woman to kill her unborn baby. From some of the talk that one hears it seems as if the women of to-day are determined to avoid ma-

ternity at any cost. Are our girls to be brought up with the idea that the only thing they should mother is a Teddy bear or a poodle dog?

In his annual address before the Section on Diseases of Children at the fifty-eighth annual meeting of the American Medical Association, Snyder aptly said: "The position assumed by modern society with reference to the unborn child has been so inviting to sentimentalists that physicians, as a rule, discuss it reluctantly, but the possible physical effects on our women and children of the widespread revolt against maternity is a question that medical men, no matter how much against their liking, must answer and consider." Have we become so calloused to the presence of the abortionist in our midst that we have come to regard him as a necessary evil? For diplomatic reasons, so called, we have refrained from exposing him, until now he believes that he can carry on his crimes with little fear that he will be obliged to answer before the bar of justice, or if he is unlucky enough to have trouble, it can easily be hushed up. How many death certificates are on file with the registrar of vital statistics in this State giving sepsis from criminal abortion as the cause of death? Very few, I can assure you, yet they occur and in no small number annually. If, as Lyons, of Chicago, says, concerted action be taken against these men by the profession at large the evil might easily be overcome. The most of them are arrant cowards, and as soon as they realize that men of undoubted professional reputation and standing are determined that they should cease plying their nefarious calling they will stop. I am not unmindful that the appearance of reputable men on the witness-stand against one charged with this crime would be a disagreeable task, to say the least, and that one would be accused of doing it only for a desire to "get even," out of jealousy or some other ulterior motive, but the fact remains that something must be done and it is the duty of the profession to do it. William W. Smithies, of the Philadelphia Jurisprudence Society, advocates the adoption in the statutes of a clause that would be of immense value in placing these men in their proper category. "Whosoever shall by any means whatsoever bring about, commit or attempt to commit an unlawful abortion, or whosoever may aid or abet in such abortion or the bringing about of such abortion, shall be guilty of a felony." This clause is very easy to understand and could not be twisted around by the usually astute lawyer that the abortionist has to be defend him and it

might prevent some of the gentlemen who pose as examples of great virtue from selling oxytocic remedies at ten dollars a box.

We are accustomed in this country to the classification of abortion as being the emptying of the uterus up to the end of the third month, miscarriage up to the end of the twenty-seventh week and premature labor up to the end of gestation. The German writers offer a simpler classification, viz.: abortion up to the time of viability and premature labor up to the end of gestation. We also have the subdivision into complete and incomplete, concealed and missed, also threatened and inevitable. Such a classification is useless, as the facts that we want to determine in a given case is whether the uterus is empty or whether it is not. If it is not, we must institute measures to bring about that end, and here, of course, comes the judgment to be exercised in every case. As J. Clifton Edgar has shown, the complete emptying of the uterus before the formation of the placenta is rare, and this holds true more especially in criminal abortion where the work is done not only in a slovenly manner that invites sepsis, but the operator relies wholly on the uterus to empty itself after he has destroyed the attachment of the ovum or killed the fetus. Concealed abortion means nothing more or less than incomplete abortion, and it demands the emptying of the uterus under surgical precautions.

With the study of the pathology of criminal abortion we are justly concerned, for it is varied and important and the life of the patient is often in the hands of her attendant, and upon his judgment and skill a great deal depends. We are not called to attend the cases that have gone well, but to the contrary and until it is evident even to the lay mind that something is radically wrong. Sepsis following criminal abortion is usually more virulent than the disease occurring after a normal birth, and this is not hard to understand when we remember that the abortionist does his work in secret, with little or no aseptic precautions, and as the most of his victims are anxious to conceal the true state of affairs competent aid is often not summoned until late. The physician who is called to attend one of these cases is in a predicament that is far from pleasant, to say the least, for in many cases his patient is an unmarried woman in good society, and that she is anxious to conceal the true condition of affairs goes without saying. It seems wise, and it is a plan that we have always followed in such cases to immediately call a colleague in consultation, and unless the

patient is in great danger of death from hemorrhage to do nothing until he arrives. The abortionist in case of trouble that might be serious for himself would not for a minute hesitate to blame whomever he could, but fortified by the presence of a colleague whose reputation is above reproach, we have effective means for combating the other side. Have your patient tell your consultant in your presence who did the work and all of the particulars, and if the patient is in danger of death have a proper antemortem statement. One might think such precautions unnecessary, but I know of more than one instance where the abortionist has attempted to put the blame onto the shoulders of honorable men.

Called to attend the case of abortion that has not progressed in a manner comforting to either patient or abortionist, we must determine the condition present. Is the patient septic and, if so, what is the nature or kind of sepsis that we have to deal with? What remains in the uterus and how long has it been there? What was the length of gestation? Personally, we go on the belief that all cases are septic and treat them accordingly. By this statement we do not mean that the most energetic treatment is instituted regardless, but it is safer to regard the woman as infected to a greater or less degree. If the patient is septic, it is necessary to understand the kind of trouble that we have to deal with, and a microscopical examination of the blood and discharge is of great value, but if the physician is without the means of conducting such an examination, he must be guided by the clinical symptoms for a correct interpretation of the condition present. It is necessary to have an intelligent idea of the pathology because treatment in some forms is contraindicated in others. Studying briefly for a few minutes the morbid conditions that may be present, we divide them as follows:

1. Toxemia: (a) Toxins of nonpathogenic bacteria, such as the putrefactive organisms. Sapremia. (b) Toxins of pathogenic bacteria.

2. Bacteriemia. True septicemia. Bacteria and their toxins in the blood.

Sapremia.—This condition is usually found in cases where the products of gestation have not been completely expelled or where, on account of the retention of blood-clots, a favorable nidus for sapremic organisms has occurred. The saphrophytes by their activity in this tissue generate a toxin that is absorbed and from this absorption we have a train of symptoms.

The clinical symptoms depend upon the amount of toxins that are absorbed and vary from the mild cases to the so-called fulminating forms in which death occurs within a few hours. The symptoms that are usually present are: a chill, followed by a rise of temperature and increase in the pulse-rate, both usually in proportion; headache and vomiting; delirium and nervousness, if the higher centers are involved; pain in the lower abdomen, especially over the fundus; the breath foul and the tongue coated; the uterus enlarged and tender, with a profuse foul-smelling lochia that may be noticed on entering the house.

Toxemia Caused by Toxins of Pathogenic Bacteria.—This condition is commonly known as surgical fever and, although it is often complicated by a sapremia, may exist many times as an independent affection. A streptococcic endometritis may be so walled off by a granulation zone that only the bacterial products reach the circulation and this may also obtain in cases of parametritic abscess, in local suppurative conditions of the peritoneum and in some cases of fatal peritonitis. In the latter form the patient is overwhelmed with the toxins and death results. With the exceptions furnished by the latter group of cases, those with a general peritoneal involvement, this form of infection will get well if properly treated.

Bacteriemia.—Bacteriemia with toxemia is true septicemia and is characterized by the presence of bacteria and their products in the blood, certain more or less constant clinical phenomena and postmortem findings. The streptococcus is usually the exciting factor, but other organisms may be the cause. In the nonmetastatic cases the postmortem findings will be limited to acute degeneration of the parenchyma of the kidneys, liver and heart with a greater or less enlargement of the spleen. The uterus on examination will not be found to be greatly enlarged, it will contain little or no débris, the discharge will be scanty in amount and with little or no appreciable odor, which fact, unless the physician is on his guard, is liable to mislead him. There is no granulation zone and the leukocytes are not sufficient to overcome the bacteria or their products. There is a constant stream of bacteria and their products entering the blood, and thus the way is paved for malignant endocarditis or metastatic abscesses. The symptoms that are usually present are an increase in temperature and pulse, although in the grave cases the pulse may be high and the temperature normal or subnormal, pain in the pelvic organs, disturbed involution, a diminished amount of lochia and the

symptoms depending upon whether the peritoneum is involved to a greater or less degree.

Where there is any doubt as to whether the uterus is empty or not, a careful exploration of that organ is necessary and if anything is present we believe that the best interests of the patient will be served if we empty it as soon as possible. The so-called conservative plan is advocated by many, but in our opinion delay is fraught with danger as hemorrhage and sepsis are liable to follow.

Although the great danger from criminal abortion is, of course, sepsis or hemorrhage, the woman who escapes with her life is very liable to some of the remote dangers which to a great extent are preventable, and unless due care is taken she is often condemned to a life of invalidism. We are obliged to consider the fact that most of the patients will not remain in bed the proper length of time, as they are anxious to get up and avert suspicion. Briefly going over some of the results, we are impressed with the following: (1) Subinvolution and displacements; (2) septic sequelæ; (3) diseases of the endometrium; (4) malignant disease; (5) nervous shock; (6) tendency to subsequent abortions; (7) sterility.

In considering the treatment of criminal abortion or its results, we are at once impressed with the varied conditions that may be present. If the uterus contains some of the products of gestation and the patient is not suffering from any of the forms of sepsis, we should at once clean out that organ. Considerable has been written lately regarding the use of the sterile finger to perform this operation and the use of the curette has been condemned by a great many men. Cases have been reported where the uterus has been punctured, but that was the fault of the man who was using it, not of the instrument. I must admit that I have had far from brilliant results in removing the products of gestation with my finger and shall continue in the use of the broad dressing forceps, the curette and douches of sterile salt water in the noninfected cases. If the case has progressed until the placenta has formed, it is dangerous to use the curette very vigorously over the placental site, but in our experience there is no instrument that will so completely clean out the uterus as the sharp curette. In the cases of sapremia the putrid mass must be removed and the cervix thoroughly dilated. This will afford sufficient drainage and your patient will get well in the majority of cases. Following the emptying of the uterus, its cavity should

be irrigated with hot sterile salt solution and free action of the bowels maintained. The use of ergot should not be omitted, as it materially aids in the involution of the uterus. The patient should remain in bed until the physician is satisfied of good involution, and thus many of the after-effects that make a woman miserable will be avoided. In the cases characterized by the toxemic and true septic forms of the disease, treatment is still under discussion. Personally, we have employed no method that has given such good results as the alcohol injections, as first advocated by Carossa and brought to the attention of the profession in this country by Ill, of New Jersey, and Wetherill, of Denver. Wetherill compares its use to that of antitoxin in diphtheria, and it is one that the general man can employ. It requires no elaborate apparatus and the patient is not exhausted by an operation that offers but little hope. No anesthetic is given and it is not needed. The patient is brought to the edge of the bed or table, the legs held by a sheet, and the external genitals cleansed. The cervix is exposed and caught with a forceps. Its canal is cleansed with 95 per cent. carbolic followed by alcohol. A cleansing douche of hot saline is given and a broad-shouldered drainage-tube carried to the fundus. Through this tube two ounces of a 50 per cent. solution of alcohol is injected and the patient returned to bed. Every three to four hours or as needed, the alcohol is injected by the nurse by means of a piston syringe. The bowels are moved by enemata. Hot saline by rectum, intravenously or subcutaneously, is indicated, and is of marked value in diluting the toxin and stimulating the kidneys and skin. The uterus should not be curetted in these cases, and the operation is no less than criminal. The man who uses the curette in every case of septic infection will have a much larger death-rate than the man who is discriminating in the use of this instrument. Ergot, strychnin, digitalis or any other indicated drugs must be used and the patient aided in her fight for life by every means at our disposal.

If there are pus collections they should be opened, yet the best results will be obtained by less surgical enthusiasm and a more correct understanding of the pathology. The many after-effects are best treated by prevention, and this is largely possible. In conclusion, I beg to make the plea that the profession of the State of Maine begin at once an earnest warfare against the abortionist wherever he may be found and remove from the ranks of a noble profession the Henry Hydes who are posing as Dr. Jekyls.

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TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

Meeting, of May 28, 1908.

J. O. POLACK, M. D., in the Chair.

DR. RALPH WALDO LOBENSTINE presented a specimen of

RUPTURED UTERUS AFTER TWO CESAREAN SECTIONS.

The case which he wished to present was one of complete rupture of the uterus through the scar of a Cesarean section. The patient, Mrs. B. G., IV-para, was admitted to his service at the New York Lying-In Hospital on December 10, 1907.

Previous History.—She had been delivered in 1904 by Cesarean section because of a flat rachitic pelvis, after a labor of thirty-six hours, with the cervix admitting three fingers. A long abdominal incision was made, extending below the umbilicus. A longitudinal incision was made in the uterus. The uterine wound was closed with three layers of suture—the first two of chromic gut, the last of plain cat gut.

In 1906, a second Cesarean section was performed by him as the child was much too large to be delivered through the natural passages. The abdominal incision was shorter and higher than in the first Cesarean section. The incision was made well up in the fundal region, but was somewhat longer than they usually made, as the presentation was a breech with prolapsing feet; thus necessitating a version from above. The uterine wound was closed in three layers as in the previous instance, but plain catgut was used throughout. The scar of the first operation was not noticed at this time. Recovery was uneventful.

Present History.—The patient was brought to the hospital in a condition of extreme shock and with a very imperfect history of her labor. From the latter, however, we decided that the uterus had ruptured at least eighteen hours prior to admission after having had labor pains for only about five hours.

On admission, the abdomen was markedly distended. The fetus could be plainly felt. The entire abdomen was exquisitely tender. Vaginally, the cervix was found to be soft, 2.5 cm.

long and admitted 1 + fingers. No presenting part could be felt. The pulse was barely perceptible. The patient looked as if she would die at any moment. Rapid preparation was made for an operation; with the beginning of the operation an intravenous saline infusion was given. The peritoneal cavity was opened through an incision 10 cm. long, the incision extending both above and below the navel. The child and placenta were found free in the peritoneal cavity and were at once removed. The uterus lay in posterior part of the abdomen and was opened up vertically from the internal os to fundus along the anterior wall. The rupture was through one of the Cesarean section wounds, and was so extensive that the whole uterus was flattened out. A supravaginal hysterectomy was done, all blood-clots removed, a gauze drain was passed down through the cervix and a second one brought out through the lower angle of the abdominal wound. The wound was closed rapidly in three layers. Dry, sterile dressings were applied and the patient was further treated for shock and hemorrhage. The pulse at the end of the operation had improved under the saline infusion.

The patient did surprisingly well after the operation. She recovered rapidly, for the first seven days her temperature never arose to 100° F., while the pulse ran between 90 and 100. She was to sit up on the eighth day, but at this time she contracted a lobar pneumonia of the right side. The process was a severe one and caused her death eight days later, *i.e.*, the sixteenth day after operation.

On examination of the specimen, there was an undilated cervix and the uterus opened up from the internal os to fundus, along one of the Cesarean section scars. To the right of the rupture was seen the high scar of the other operation. Had the patient entered the hospital as she had been advised to do, before or at the beginning of labor, this seeming accident could have been avoided. Inasmuch as the pelvis was severely contracted and the cervix very rigid from never having been dilated above 4 cm., the uterus gave away at its weakest point, which was evidently the lower angle of the Cesarean scar.

DR. SIDNEY D. JACOBSON said it was a cause of genuine regret that Dr. Lobenstein's patient died. He deserves the credit, which would have been his, had she recovered. It was not his intention to criticise neither does he wish to cast any reflection on present-day tendencies, but it had seemed to him that in some cases Cesarean section was performed unnecessarily. There was an operation which might be said to be a natural competitor of Cesarean section, especially as its immediate and remote dangers were very much less; he referred to pubiotomy. Its advantages were that the peritoneal cavity was not opened, it could be done in cases which were already infected, it was performed in a very much shorter space of time, and left no scar in the abdomen to predispose to a subsequent hernia and, above all, there was no scar left in the uterine wall to endanger the patient's

life in a subsequent pregnancy. Moreover, after pubiotomy, the pelvis was left permanently enlarged. A few months ago, he had the privilege of presenting to this section a woman and her baby, then about five months old. Both were in perfect health. He delivered this woman of that baby by pubiotomy. Briefly, the facts were these: The woman, a primipara, about forty-two years old, was admitted to the service of Professor Boldt, in the Sydenham Hospital, after fruitless attempts at delivery had been made at her home. He desired here to thank Professor Boldt for his kindness in turning the case over to him. Upon examination the patient, though otherwise healthy, showed unmistakable signs of a severe attack of rickets in her childhood. She was apparently at term and the child was living. The patient appeared to be exhausted from many hours of unproductive pains. Her pelvis was generally contracted, rachitic type, and considerably flattened from before backward. The membranes had ruptured several hours before. The cervix was dilated to the extent of readily admitting two fingers. It was clear that the woman was unable to deliver herself. Cesarean section was not considered indicated because the uterus was, at least theoretically, infected. Perforation of the living child was considered unjustifiable. Forceps or version would have been not only dangerous to the mother, but useless. The only recourse seemed to be pubiotomy. This was accordingly done after the subcutaneous method of Döderlein. The pubic bone was sawn across by the Gigli saw and the forceps used to extract the child. No sutures were introduced. Hemorrhage was profuse. The wounds and the uterus and vagina were packed with sterile gauze. The patient was put to bed between two sandbags and her feet were tied together so that the great toes faced each other. The patient made a smooth recovery and nursed her baby regularly. Sixteen days after the operation she got out of bed. Eighteen days after the operation she left the hospital and on the twenty-second day, or a little more than three weeks after the pubiotomy, he saw her on the street pushing the baby-carriage before her. There have been only about twenty pubiotomies done in America so far, but he hoped to see this life-saving operation come into general use and favor.

DR. LOBENSTINE agreed that Cesarean section was done too frequently; in the doubtful cases he believed it wise to wait and see just what the patient could do for herself. The dangers of this operation were frequently overlooked. The patient should be warned that she should enter the hospital some time prior to the expected full term. She should be warned of the danger incurred after a Cesarean section.

Dr. RALPH WALDO presented a

DERMOID CYST OF THE RIGHT OVARY IN A CHILD OF NINE.

A woman brought the child to his office. During the last three days she had complained of pain in the abdomen. On

examination he found a mass situated above and below the umbilicus. He believed there was an ovarian tumor. The abdomen was opened and an 8-ounce dermoid removed. The left ovary was as large as in an adult. The patient made an uneventful recovery.

DR. H. GRAD reported two cases of

HYPEREMESIS GRAVIDARUM IN TWO SUCCESSIVE PREGNANCIES.

In both cases the clinical picture was so alarming that radical measures were most urgently called for. One patient was suffering from a retroverted gravid uterus. This fault was corrected and the uterus held in place by a pessary and packing, but without giving the slightest relief. In the light of our present knowledge only the mildest cases of vomiting of pregnancy can be considered as physiological, and it is a question if even these can be so considered. Literature shows that hyperemesis is a symptom complex of grave changes in the liver and kidneys, and that there is a close relation between this condition and eclampsia, as well as acute atrophy of the liver. The underlying condition is one of toxemia. We have learned that there is marked disturbance of nitrogenous metabolism, the liver failing to oxidize the proteid derivatives into urea. For this reason the proteid derivatives, especially aminoacids and ammonia, are no longer combined, but circulate freely in the blood in poisonous form and are to some extent excreted by the kidneys. In these cases of toxemia the urine contains acetone, diacetic acid, oxibutric acid, ammonia, uric acid, leucin, tyrosin, indican, sometimes bile pigment, and other unoxidized proteid radicals, and instead of the sulphate salts, the unoxidized sulphur compounds are found. Albumin and casts may be present, but are sometimes absent even in severe and fatal cases. Only a complete laboratory analysis of the urine can be of any value as regards the degree of the disturbance of the nitrogenous metabolism in each individual case. As it was not possible to express in definite terms what really constitutes a normal nitrogenous ratio, it was quite impossible to express numerically what constituted an abnormal nitrogenous ratio between the nitrogen derived from urea, the nitrogen of ammonia and that from undetermined sources. In order to interpret the abnormal nitrogen output it was necessary to understand the normal. For this reason the writer placed in bed at the Sloan Maternity two normal pregnant women during their last month, whose diet was solely milk and water, the same as that given the toxemia patients, and the nitrogenous ratios in the twenty-four hours' specimens of these women were determined by a professional chemist for each of the nine days, with the following results. The average for the two patients for the nine days was urea nitrogen, 83.26 per cent., ammonia nitrogen, 5.16 per cent., and amidoacid and undetermined nitrogen, 6.43 per cent. It was found that urinary

findings and clinical evidences did not always harmonize. A patient may have low urea nitrogen and high undetermined nitrogen and present few or no symptoms, while her sister with the same nitrogen ratio findings will suffer with persistent vomiting, headache and undermined mental and physical vigor. While nephritis is more frequently present in the pre-eclamptic stage of toxemia, and always present in eclampsia, it occurs also in cases of hyperemesis. Cases of persistent vomiting in the early months of pregnancy may suffer with albuminuria in the later months of gestation. This may show that the toxemia finally resulted in kidney changes as is shown by signs of nephritis. Cases of disturbed nitrogen ratio, plus toxemia have been observed where several weeks later nephritis developed with the disappearance of the abnormal nitrogen ratio. It has been observed that under the latter conditions the prognosis of the case is better than when a nephritis and a disturbed nitrogen ratio coexist. The theory that the toxemia of pregnancy is of the nature of an acid intoxication has been found lacking as far as definite chemical confirmation goes. A clinical research into the question of oxidation has resulted in learning that it is not so much a question of true oxidation as of failure on the part of metabolic processes to remove the so-called amido group during the conversion of proteids into urea and ammonia. This failure has been termed "Deficient desamination" by Ewing. The conception of the disease as a disorder of metabolism removes much of the point in the long-standing discussion whether the process is an affection primarily of the liver or of the kidneys and to what extent an hepatic insufficiency or intestinal intoxication may be concerned. Changes in the structure and function of the liver arise early in the disease, since the organ is chiefly concerned in nitrogenous metabolism. Once altered in structure, there is good reason to believe that the liver contributes prominently in a vicious circle of influences which maintain the disorder. At a later stage, the kidneys are involved by a mechanism that is little understood. Not alone the abnormal urinary findings, but definite pathological lesions in the liver are the bases for establishing the toxemia of pregnancy as a definite disease. Eclampsia, acute yellow atrophy and pernicious vomiting, all may show pathological changes in the liver. The writer then cited Ewing's description of the liver changes in eclampsia. In acute yellow atrophy, the liver is diminished in size and the microscope shows in the hepatic lobules, a complete fatty degeneration of the inner two-thirds, an area of necrosis and disintegrated cells outside of this, while the periphery of the lobules shows cells undergoing granular degeneration. In pernicious vomiting, the same hepatic changes occur in a milder degree. These are cases of toxemia without marked hepatic changes, but this does not necessarily argue that the toxemia does not depend upon disturbance of the liver function. The formation of urea is a liver function, and if the organ fails to functionate, a disturbance

of the metabolism must occur. Disturbed function does not necessarily mean anatomical changes. Herz, in 1898, elaborated the theory that the liver failed to functionate and to oxidize the products of digestion because the hepatic cells were functionally paralyzed. This paralysis is not easily explained. Herz claims that it can be brought about by tying the ureters. It has also been claimed that hepatic congestion is a frequent result of suppressed menses, no matter what the cause of the suppression. As a result of circulatory disturbance, hepatic enzymes fail to produce, but no structural changes in the liver cells need necessarily occur. Under such a condition, the oxidizing capacity of the liver will be at its lowest point.

The following case was seen for the first time by her attending physician on October 25, 1907: Mrs. B., aged twenty-six, married six weeks, had always been in good health. She had been suffering from nausea and vomiting for three weeks, and, at the time of consulting her physician, it was impossible for her to retain any nourishment. She was confined to bed, slept little, was constipated and complained bitterly of nausea and pain in the abdomen, especially the epigastric region. Her temperature was 98.6 and pulse 110. The vomitus was green in color. The treatment consisted of bismuth subnitrate, gr. x; cerii oxalate, gr. x; morph. sulph., gr. ʒ, every four hours. On October 26, vomiting stopped for short intervals, but she developed a burning sensation in the stomach. The bowels did not move by enemata. Colonic irrigation was resorted to and rectal feeding given. On November 16, when was again seen her condition and symptoms remained about the same. Bimanual examination showed the cervix long, uterus retroverted and pregnant about two months. Iodin and tampons were applied for three days without effect. Saline rectal injections and nutrient enemata were given, and champagne by the mouth. The patient was very restless. Her pulse was now 130, temperature, 98.6; her tongue was dry, heart and lungs negative, abdomen tender and exceedingly hyperesthetic. The slightest touch excited distressing retching. Her condition was becoming worse and she was delirious at times. Morphine in full doses gave no relief. The urine showed high specific gravity, was scant in quantity, but contained no albumin or casts. After consultation, the uterus was replaced and held in place by packing. On November 24, the patient was in a dangerous condition. Pulse 140, weak, and temperature 99.6. She was etherized and curetted. While recovering from the anesthetic she vomited twice, but from that time her stomach symptoms began to improve. On the third day after the evacuation of the uterus the patient began to take nourishment and was out of bed in ten days. Nothing was heard of her until March 27, 1907, when she again complained of her former symptoms. Treatment was again instituted as in the former pregnancy, but her condition grew steadily worse. She became delirious. The urine showed

a specific gravity of 1030, no albumin, no sugar, no casts, urea 14 gr. to the ounce. The blood showed over 4,000,000 red blood-corpuses, 11,000 white and 85 per cent. hemoglobin. On March 30, she was anesthetized and the uterus emptied. She soon rallied, but when questioned showed that she had no recollection of events three days prior to the operation and one day after.

DR. SIDNEY JACOBSON said if you took a policeman off his beat and laid him in bed for a couple of days and starved him you would find acetone and diacetic acid in his urine. Now, if you made him vomit a few times, his urine would most likely contain also beta-oxy-butyric acid. These substances show that the patient was starving and living on his own tissues for the want of other food. As soon as carbohydrates were administered, these acids disappear from the urine.

DR. HAROLD A. MILLER, of Pittsburg, Pa., presented a paper on

PLACENTA PRÆVIA CENTRALIS.

The pendulum in the treatment of this condition had swung from the ultraconservative to the extreme radical, or from the period of universally waiting for spontaneous termination of pregnancy with the survival of the elect to the present day when the advocates of Cesarean section advised this method as soon as placenta was diagnosed. The origin of the blood prior to delivery was from four principal sources: First, the veins of the placental site; second, the intervillous spaces of the placenta; third, the circular sinus of the placenta; and, fourth, but rarely from interference with the fetal blood-vessels.

About one and a half years ago, in a discussion, a fellow-practitioner suggested the possibility of assisting in the control of the hemorrhage by ligation of the uterine artery through the vagina. In February, 1907, their first case presented itself. After careful preparation, tenaculum forceps were applied to the anterior and posterior lip of the cervix; the cervix was pulled down into the vagina as far as possible. A retractor held by an assistant applied to the vaginal wall on the left side of the patient permitted the uterine artery to be palpated with the index-finger of the left hand and a catgut ligature thrown around the artery prior to its division into the anterior and posterior cervical artery. This procedure was repeated on the right side of the cervix, with the exception that the uterine artery was palpated with the index-finger of the right hand and a ligature thrown around with the left hand. The needle was introduced below the artery and brought out above in order to avoid the possibility of including the ureter. After this rapid dilatation was resorted to by the use of the Bossi dilator. In about twenty minutes the cervical canal was dilated to 6 cm. A finger was then introduced along the left wall of the lower uterine segment until a leg was grasped which was brought down and the child delivered. A cervical tear which was started by the Bossi dilator was increased by the rapid

extraction of the fetus. The tear was very deep, extending well up into the body of the uterus and was with difficulty repaired, after which the control ligature around the uterine artery was removed and the patient, he believed, lost but little, if any, more blood than during a normal labor. Since this he had delivered ten cases of placenta previa centralis by this method. Two had very severe hemorrhages and suffered from such profound shock when he first saw them that death was only a matter of a few hours. His results in these cases seem to demonstrate the fact that the cervix did not seriously suffer from the restricted blood-supply and that collateral circulation was established to a sufficient extent.

Dr. Miller offered the following summary:

First.—The operation of vaginal ligation of the uterine artery and its branches may be considered as a simple operation, devoid of danger and may be done without anesthesia by anyone who is familiar with the anatomical and the surgical technic of the parts involved.

Second.—This operation does not remove or permanently injure any of the essential organs of generation and, therefore, does not in any manner decrease the possibility of future child-bearing nor increase the hazard if conception should take place as proven by the fact that the first case delivered by this method has since given birth to a full-term healthy child.

Third.—The tying of the uterine artery immediately and absolutely controls all antepartum hemorrhage by cutting off the bloods-apply to the placenta. The single exception is the rare hemorrhage during delivery caused by injury to the fetal vessels.

Fourth.—He believed collateral circulation would not be established until sufficient time had elapsed for them to successfully combat a moderately severe degree of anemia before proceeding to deliver.

Fifth.—By removing the necessity of haste it gives time for thorough preparation of the patient and the aseptic technic of the operator.

Sixth.—It permits of lesiurely dilating the os either bimanually or by means of one of the many forms of the instrumental dilators

Seventh.—The fetus may be delivered either by version or the head may be delivered first by the application of forceps.

Eighth.—The operation will become routine practice of great value in all bleeding from placenta previa prior to the attempt to deliver.

Ninth.—The ligation of the uterine artery will absolutely control postpartum hemorrhage from the placental site, and with careful attention to the proper method of delivery postpartum hemorrhage in cases of placenta previa from other sources is rare.

Tenth.—It will, no doubt, slightly increase the fetal mortality on account of the early shutting off of the placental circulation.

Eleventh.—It so aids in handling cases of placenta previa that no mortality should occur except from unavoidable sepsis.

REVIEWS.

ADENOMYOMA OF THE UTERUS. By THOMAS STEPHEN CULLEN, Associate Professor of Gynecology at the Johns Hopkins University; Associate in Gynecology at the Johns Hopkins Hospital. Illustrated by HERMANN BECKER and AUGUST HORN. Pp. 270. Philadelphia and London: W. B. Saunders Co., 1908. Price, \$5.00.

It is not often that one has the pleasure of reading the details of an original investigation presented in such a complete and scientific style and with the luxurious setting that is given to Dr. Robb's work. The Johns Hopkins has in this and previous books set an example in the production of medical works that threatens to pauperize the writers of other centers.

In October, 1894, Dr. Cullen found, on examining the walls of a uniformly enlarged uterus, that the increase in thickness was due to the presence of a diffuse myomatous tumor and that the uterine mucosa was at many points flowing into the myomatous tissue. This condition of adenomyoma had before been recognized as a distinct entity, but was thought to be very rare. This case was reported in March, 1895. Since then a search of the pathological material at the Johns Hopkins has enabled Dr. Cullen to find and examine over ninety adenomata of various kinds in the uterus, and the detailed reports of these cases make up the body of the book.

Dr. Cullen has demonstrated that the condition is not rare, but rather common, occurring in nearly six per cent. of myomata; that these growths may be found in any portion of the uterus; that the gland elements are similar to those of the uterine mucosa and are derived from it or from Müller's duct; that the disease is most prevalent between the thirtieth and sixtieth years; that the clinical diagnosis is relatively easy for the reasons: (1) That the bleeding is usually confined to the period; (2) there is usually much pain referred to the uterus at the period; (3) there is usually no intermenstrual discharge of any kind; (4) the uterine mucosa is perfectly normal and may be rather thick.

The book is printed on thick, glazed paper in duotone ink, which allows the sixty-eight original drawings by Becker and Horn, which form a prominent feature, to be reproduced in a way that retains all of their wonderful detail and beauty.

THE NATURAL HISTORY OF CANCER, *With Especial Reference to its Causation and Prevention.* By W. ROGER WILLIAMS, Fellow of the Royal College of Surgeons. Octavo. Pp. 519. New York: Wm. Wood & Co., 1908. Price, \$5.00, net.

The distinguished author of this book owes his fame largely to the work he has done in the study of the various phases of malignant disease. He believes that the study of cancer has hereto-

fore been investigated far too exclusively by the pursuit of details in ultimate analysis, and hardly at all by the synthetic and comparative methods which have been so profitably employed in other branches of biological research. He believes that only by concentration can a higher plane of progress be attained and the enormous stores of miscellaneous items of knowledge accumulated during the last half-century by dispersive analysis be profitably utilized for cancer research. To this end he has employed a synthetic method, and in his conclusions would seem to show that there are modes of life, habits and so on which tend to prevent almost entirely the incidence of cancer in healthy stocks and greatly to reduce its ravages even among those hereditarily predisposed. He everywhere endeavors to elucidate the causation and prevention of the disease rather than its cure, for which, in his opinion, reliable indications are lacking.

The work will be read with interest and benefit by all those to whom the study of the malignant neoplasms is important, and that is to every physician.

The book is divided into twenty-three chapters which discuss, successively, the geographical distribution and incidence of cancer, the increase of cancer and its concomitants; topographical distribution; cancer and other tumors in animals and in vegetable organisms; the genesis of malignant tumors; experimental study of cancer genesis; cancer in relation to growth in general; the microbial theory; inflammation, trauma and other extrinsic factors; the question of the origin of malignant from nonmalignant tumors; multiple primary cancer and the association of cancer with other tumors; the influence of sex and age; etiological indications from the study of the life-history of cancer patients; family history; the initial seats of tumors and their relative frequency; the morphology of malignant tumors; recurrence; cachexia; quasi-malignant pseudoplasms; inflammation, ulceration, retrogression and spontaneous cure.

THE PRINCIPLES AND PRACTICE OF GYNECOLOGY. For Students and Practitioners. By E. C. DUDLEY, A. M., M. D., Ex-President of the American Gynecological Society; Professor of Gynecology, Northwestern University Medical School; Gynecologist to St. Luke's and Wesley Hospitals, Chicago; Ex-President of the Chicago Gynecological Society, etc. Fifth Edition, Revised and Enlarged. Pp. 806. With 431 illustrations and 20 full-page plates in colors and monochrome. Lee & Febiger, Philadelphia and New York, 1908. Price, \$5.00, net.

The fifth edition of this admirable and well-known text-book needs no introduction. The general plan and scope is the same as in the previous editions. The changes in gynecology since the appearance of the fourth edition in 1904 have not been great, but still have made necessary considerable condensation and rearrangement so as to accommodate the new material without materially enlarging the volume. Important changes have been

made in the chapters on the treatment of salpingitis, ovaritis and pelvic peritonitis; on the treatment of myomata uteri; on the treatment of carcinoma uteri, the ignihysterectomy of Werder being decidedly favored; on the treatment of descent of the uterus, prominence being given to the broad-ligament operation, which has recently attracted much attention; and on the treatment of retroversion and retroflexion. A new chapter has been added on incontinence of urine in women.

Forty new illustrations and full-page plates in color have been added. Operative procedures are set forth as they take place, step by step, in numerous series of drawings. For example, twenty-two drawings describe the steps of the operations of myomectomy and hysteromyomectomy, thirty-two explain perineal lacerations and perineorrhaphy.

In an introductory chapter, the author has been led to defend the fact of the specialty of gynecology. His views are so in line with what the JOURNAL urges and believes to be true that we are impelled to quote them somewhat fully. In closing his chapter, Dr. Dudley says:

"In considering this most recent attitude toward gynecology, I do not refer to the practitioner who may be so situated that the most competent experts are not available; necessarily, he may be compelled, to the best of his ability, not for himself alone, but in the interest of his patient, to undertake not only gynecology, but all the other specialties, nor do I deny that a general surgeon of sufficient versatility may carry on miscellaneous general surgical work and at the same time, if he will undergo the necessarily long and careful training, may acquire the special judgment, the special diagnostic and operative technic essential to proficiency in the practice of a great specialty; but this admission does not weaken the indictment which I would offer against a type of general surgeon, whose number increases day by day, whose relation to this specialty is the outcome of a reasoning all his own, a reasoning from the plausible premise that 'the gynecologist, having perfected and simplified his specialty, has found it too narrow and has expanded' to the specious conclusion that gynecology is an insignificant branch and that the gynecologist, therefore, has undertaken general surgery. This logic gives rise to a sophistry: if the gynecologist is a general surgeon, conversely the general surgeon is a gynecologist. As the times change and we change with them, this type of universal operator, quick to seize on and turn to his own account the intimation that this specialty has passed, with refinement neither of diagnostic nor operative technic, with no appreciation of his limitations, hypnotized by an apprenticeship of six weeks in some postgraduate school, or by no apprenticeship at all, emboldened by the fact that no one has called him to account, would make gynecology crude and common, would persuade the public and the profession that it is a mere caudal appendix to surgery on which no one fears to tread. Let us for the moment dismiss the general

discussion of the subject and imagine a private hospital conducted under certain practical conditions of business management and promotion, with a year of active practice in capital operations, most of them belonging to this, forsooth, insignificant branch of surgery and a mortality of 70 per cent., and then, with this experience as a background, going on for an additional few weeks to eleven more consecutive abdominal operations and 100 per cent. of mortality. This is an extreme but nevertheless historical example, taken not from the dark ages of surgery, but from our own times. It would be painful to expose other instances.

"Gynecology has not passed. We are not general surgeons. We are specialists in the diseases of women, and as our later transactions abundantly show, we are to a rapidly increasing extent specialists also in the wider field of abdominal surgery, a field in which the account on the ledger as it stands to-day will show general surgery indebted to us for a great part of its practical and scientific progress; the claim is valid, for we were blazing the trail through this territory when it was an untrodden wilderness, and it is ours by right of discovery; we were giving laws to govern the conduct of the stranger in this field when it was unknown and unconquered, and it is ours by right of conquest; we received from the pioneers, our teachers, some of whom are with us now, the principles and precepts on which has been built up this most aggressive department of surgery, and it is ours by right of inheritance.

"Marion-Sims was not a general surgeon when he laid down the laws which to-day govern the surgery of the gall-bladder, when he foreshadowed the modern treatment of gunshot wounds of the abdomen and thereby set in motion a tide of general abdominal surgery of which the ebb flow, particularly in the upper zones of the abdomen, where we have joined hands with the general surgeon, is already overdue. Do the traditions which properly belong to us count for nothing? Shall we retire into the background? Shall we organize a society of the Cincinnati, enter into our second childhood, and live on the memories of the past? Is our work done? Shall we say, 'Troy has been, we have been Trojans'? If our work is done, why should we not go at once into voluntary liquidation? Why should a special society hold another meeting? But so long as in the diseases of women there are practical and scientific problems to be solved, our work is not done. Does not the increased strain of modern life, notwithstanding improved knowledge of sanitation and hygiene, bring about exaggerations of pathology which will demand not less but more of the gynecologist? If we do not respect our own specialty, who will? Let us consider, for example, the every-day subject of dysmenorrhea, about which as yet we know but little; the causes of eclampsia, of which we know less; the purpose of menstruation, of which we know nothing; the unknown conditions, which in one case will supply defense against general septic peritonitis and in another apparently similar case will open the way

to a rapidly fatal peritoneal infection. Let us reflect that we have not spoken the last word on the surgical treatment of descent, retroversion, and other deviations of the pelvic organs; let us consider whether in the next thirty years we or the general surgeons are going to make such improvements in practical gynecology that the hysteropexies, the hysterorrhaphies, the suspensions, the fixations and a number of other procedures may look to our successors as crude and irrational as the clamp and routine use of the drainage-tube in ovariectomy look to us at the present time.

“And now, supplementary to this discussion, may I offer a suggestion? In recent years, abdominal surgery has so far engrossed the mind of the gynecologist, not to mention that of the general surgeon, that by comparison the minor plastic work to some extent has been neglected or given into incompetent hands. It is perhaps not too much to say that our fathers in their day did better plastic surgery than we are doing in ours. Indeed, a revival of interest may be necessary in order to save this part of gynecology from becoming a lost art. There is now accumulating a very appreciable number of patients on whom plastic operations, some of them repeated on the same patient many times over, have been performed with indifferent or injurious results. Many such patients need to have the work undone or done over again. And this class of cases now, therefore, is making an increasing demand on the attention of the competent gynecologist. It is time, therefore, without losing sight of the claims of capital surgery, to bestow adequate attention on the homely every-day problems of minor gynecology.”

HERMAPHRODISMUS BEIM MENSCHEN. VON FRANZ L. V. NEUGEBAUER. Warschau. Werner Klinkhardt, Leipzig. 1908. Pp. 748. Illustrated.

This practical work is of unusual value and should be in every medical library, because from it the physician can get information on any doubtful case of hermaphrodisism that may present itself in his practice.

The development of the embryo is accurately described. Nearly all important literature relating to embryology is made use of to place before the reader everything that is so far known on the subject.

After completing the embryological study, the author describes the varieties of hermaphrodisism, and for practical reasons accepts for pseudohermaphrodisism the classification of Klebs.

Hermaphrodisism has been described by Aristotle, Hippocrates and Galen. The old imperial laws regarding hermaphrodites are mentioned. As late as 1602, the Parisian Parliament condemned a hermaphrodite to death by burning at the stake, because he had performed the functions of the sex in which he declined to be classed.

While ancient and mediæval literature contained observations

on hermaphroditism, the scientific study did not begin until the nineteenth century.

A genuine hermaphrodite is an individual who, while able to impregnate another, may itself be impregnated or may impregnate itself. Such condition does not exist in human beings. Even in a functional sense, true hermaphroditism is exceptionally rare in the human race. Only five cases of true hermaphroditism are on record. Numerous cases have been reported in literature but the microscope failed to verify the correctness of such diagnosis.

An unusually large number of cases is cited, the greatest number that has ever been published by one author, with observations, interesting histories and instructive cuts. The publication does credit to the genial and diligent author.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION. Volume XX. Edited by W. D. HAGGARD, M. D. Pp. 570.

This volume contains the forty-eight papers and the discussions which came before the society at its twentieth session held at New Orleans on December 17, 18 and 19, 1907, many of which are of very great practical interest and value and which fully maintain the high standard this association set for itself at its first meeting twenty years ago.

STATE BOARD QUESTIONS AND ANSWERS. BY MAX GOEPP, M. D., Professor of Clinical Medicine at the Philadelphia Polyclinic; Assistant Visiting Physician to the Philadelphia General Hospital. Pp. 684. Octavo. Philadelphia and London: W. B. Saunders Co., 1908. Price, \$4.00, net.

This is a compilation of the questions asked by the various State examining boards during the last four years, and its purpose is to provide a convenient compend for the use of those who wish to prepare themselves for State board examinations. Answers are given in a condensed form, the definitions being largely taken from standard text-books.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

The Suprarenal Capsules in Puerperal Eclampsia and Nephritis of Pregnancy.—On account of the universal presence of hypertension in puerperal eclampsia and the possible effect of the suprarenal capsules on the production of hypertension, J. L. Chirié (*Tribune Médicale*, June 13, 1908) has made a careful microscopic examination of the suprarenal capsules in nephritis of pregnancy. Seventeen cases of eclampsia were examined, of which twelve showed retroplacental hemorrhage, one nephritis, and four died in coma. Fourteen cases of infection were also examined. The conclusions at which the author

has arrived are that in these conditions there is a constant cortical and medullary hyperplasia of the suprarenal capsules. Medullary hyperplasia occurs before cardiac hypertrophy. Suprarenal hyperplasia is secondary to the diseased kidney condition. This hyperplasia bears a special relation to the antitoxic function of the gland, and may play an important rôle in the production of increased arterial tension of eclampsia. In these cases it is by the intermediary action of the hyperfunction of the gland that a relation of cause and effect is established between the difficulties of renal secretion and the modifications of arterial pressure; clinically, this relation has been demonstrated.

Symphyseotomy and Hebotomy.—V. Cocq (*Bull. de la Soc. Belge de Gyn. et d'Obst.*, vol. xix, No. 1, 1908), after giving the histories of four successful symphyseotomies, compares this operation with hebotomy, concluding that the latter has not sufficient advantage to supplant the former. Symphyseotomy is an excellent operation when practised with a good technic and within its proper limits; that is, in pelves with a diameter of over 7 cm. and at term. In diameters less than this, it should never be performed. Cesarean section is more attractive, but it is not always possible to have the necessary conditions for its successful performance, *i. e.*, a woman uncontaminated by frequent examinations and the possibility of complete asepsis in the surroundings. In general practice it is often necessary to deliver by operative means when these conditions cannot be attained. In the country it is not always possible to secure two capable assistants, nor has every general practitioner the necessary instruments. In these cases section of the pubis permits him to save the fetus while lessening the dangers of the mother. Cesarean section is to be preferred when the necessary conditions are obtainable. Comparing symphyseotomy with hebotomy as to its special advantages, the author believes that a sufficiently strong consolidation of tissues is obtained by symphyseotomy. As to hebotomy exposing the patient to less danger from tearing of the soft parts, these wounds occur when the pelvis is spread apart too far. This will not happen, provided the operation is not done in pelves of less than 7 cm. conjugate. The head has a tendency to push the soft parts before it, hence an aid should keep them in position as far as possible. Another precaution is to disengage the head in the transverse position, for in the occipito-pubic position the occiput will be supported only by the soft parts, which will be much stretched. The perineum may be incised if necessary. Less hemorrhage is supposed to occur in hebotomy; but the author finds that when not done in a woman with varices, the hemorrhage is not greater. A necessary precaution is to place the finger behind the symphysis when making the section and to tampon the space with gauze afterward. In subcutaneous hebotomy there is generally a

hematoma, which the author believes is not a condition to be lightly passed over. He rejects the subcutaneous operation entirely. As to there being less risk of infection in hebotomy, the author believes that aseptic precautions render symphyseotomy quite as safe. The slightly vascular cartilage is less likely to be infected than the highly vascular bone. The author therefore prefers symphyseotomy.

Cesarean Section and Lumbar Anesthesia.—Oscar Polano (*Münch. med. Woch.*, June 2, 1908) gives an account of three Cesarean sections done under lumbar anesthesia, with safety for both mother and child. There was an entire absence of pain throughout the operation in all three cases. All three patients suffered from rachitic contraction of the pelvis, and the lumbar puncture was easily made. The pelvis was slightly elevated after the injection. There were no disagreeable symptoms, such as headache or paresis. All three women made a good convalescence and left the hospital three and a half weeks after the operation. All dangerous compression of the child's head and thorax was avoided by this method of delivery. The children when delivered had a normal red color, the pulse in the cord was normal, and there was no carbonic-acid poisoning of the blood in the infant. All of the children were vigorous and cried loudly when handled. The breathing began naturally as soon as the cord was cut. In each of these cases the uterus contracted normally after delivery and remained well contracted with very little loss of blood. By this method of anesthesia the painlessness is perfect, and the dangers of asphyxia for the child and of atony of the uterus for the mother are absent.

Observations on Nursing Women.—S. Jacobius (*Arch. f. Kinderheil.*, Bd. lxxxiv, H. 1 and 2), after observations on many nursing women who had given up nursing their children for some reason, not always good a one, finds that menstruation begins in many women soon after the puerperium, and in the majority of women before six months. The production of milk does not seem to be materially affected by its presence. In the clinic for infants at Berlin, where prizes are offered for the longest nursing of the children, the author has never seen a case in which it was necessary for the mother to stop nursing the child on account of the beginning of menstruation. It was also noted that when a mother has ceased nursing for an interval even as long as thirty days, it is possible for her to revive the flow of milk and to again nurse the child. Such a procedure is not injurious to the child, the secretion seeming not to have so changed as to do it any harm.

Diet of Nursing Women.—L. Bouchacourt (*Jour. de Méd. de Paris*, June 20, 1908) states that the diet of the nursing woman should be most abundant, but its quality is also important. Vegetables should be the most important part of it, meat being of less value in producing milk. Of the vegetables that pro-

duce the milk, lentils, cotton-seed oil cakes, carrots, beets, chicory, parsley, peas and beans are the most valuable. Cod-liver oil is also valuable. The author believes that milk and light beers and ales are galactogogues. He would arrange the diet thus: bread 400 grams, meats or fish 250 grams, dry vegetables 500 grams, fresh vegetables 300 grams, vermicelli and macaroni 100 grams, sweet fruits and candies 100 grams, butter, milk and cheese 1500 grams, beer or cider 1000 grams, water 1000 grams.

Severe Bleeding at the Time of Labor.—Schickele (*Münch. med. Woch.*, May 26, 1908) says that severe bleeding at the time of labor is generally due to implantation of the placenta over the os, premature separation of the normally located placenta or to a placenta marginata. The author believes that bleeding under the placenta is rather frequent, old clots being found under it after delivery. He believes that such clots are common causes of abortion and of maldevelopment of the ovum. Loosening of the placenta seldom leads to dangerous bleeding. In case of severe bleeding it is always a question how much blood the patient has lost and how much she can lose and live. Facts that have an important bearing on this are the general nutrition and build of the patient and the condition of the heart and kidneys. Women who have borne many children within a short period, especially if they have had habitually severe bleeding, are less able to stand hemorrhages. Cases which have lost much blood before admission to the hospital have a bad prognosis. The pulse is the great criterion of the patient's condition, as well as her general condition. Sometimes women who are apparently doing well have a sudden failure of the pulse. One of the best remedies is injection of saline solution by the rectum and intravenously. Cases of bleeding after rupture of the uterus bear hemorrhage much better than those who have placenta previa.

Early Rising After Labor.—Wilhelm Rosenfeld (*Gyn. Rund.*, H. 11, 1908) calls attention to the possibility of the position of the newly delivered woman on her back for nine days being a cause of retrodeviation. Coe permits his patients to rise to empty the bladder within three hours after labor. Other obstetricians allow of special gymnastic movements beginning three days after labor, consisting of movements of the abdominal muscles and of the sphincter ani and vulvæ morning and evening. No bad results have been seen from these movements, and others have begun to allow the puerperal woman to get up on the third day for an hour or two, in cases in which there is no rise of temperature. This aids in the involution of the organs, makes the movements of bladder and bowels easier. The strength of the muscles is better preserved and the appetite is better. The questions that must be decided in reference to this procedure are whether embolism will be caused and whether prolapsus and retrodeviation will be favored. Prolapsus will

occur only when there has been a previous lesion of the pelvic floor, either tearing or stretching the fibers. Long lying in bed will not cause a union of these ruptured muscle-fibres, as they immediately retract and the ends do not reach one another. An etiological factor in prolapsus is atrophy of the pelvic floor. Long rest in bed will increase the weakness of muscles, while the natural movements will tend to strengthen them. Women who have been up for some hours each day feel better and stronger than those that have lain in bed for nine days and are then obliged to go home and do their own work and care for the child. In January, 1908, the author began to allow the puerperal women to sit up for a few hours each day after the third day and to increase the time each day to the ninth, when they finally got up permanently. These patients had undergone a perfectly normal labor and had no rise of pulse or temperature. After the first three days a vaginal examination was made and it was ascertained that there was no abnormal condition of the genital organs before the woman was allowed to get up. These women wore a well-fitting binder all the time. From January 15 to March 30, 160 women were confined at the Vienna Lying-in Hospital. Of these 102 were able to get up on the third day. In only one case was there any rise of temperature, and this was from a beginning mastitis which was relieved by Bier treatment. No hemorrhages were observed. At the end of seven days the uteri were at the level of the symphysis, and at the ninth day could not be felt. The author considers these results sufficiently good to justify further trials of this method. All the women stated that they felt better and stronger than when they lay in bed for nine days.

Etiology of Puerperal Retroflexion.—R. Ziegenspeck (*Zent. f. Gyn.*, June 6, 1908) finds it stated that retroflexion in the puerperal state arises only when there is parametritis or perimetritis. Chronic atrophic parametritis never occurs in the puerperal condition, yet it is the most frequent cause of retroflexion, according to some authors. The author has examined every puerperal woman having parametritis who has come under his observation, to ascertain whether the condition came on after labor, and has found that the most pronounced cases occurred after labor. In large maternity hospitals the occurrence of infection is prevented by asepsis, but in the homes of the patients this is not possible. The author makes it a habit to examine every labor patient from eight to twelve weeks after delivery, even when no symptoms are complained of, and has rectified many displacements and kept them in position until cured. Retroflexions have been found in the first as well as in later confinements. The first confinement predisposes the patient to retroflexion, and flexions which have existed previously recur after labor. Overfilling of the bladder is a frequent cause of retroflexion, the full bladder causing the uterus to be pushed backward. If the patient lies on her side, it is found that anteflexion is increased. Re-

tention of urine in the puerperium should be guarded against. It may result from spasm of the pelvic muscles due to trauma during labor, from injury of the urethra by the pressure of the head and from edema of the bladder. These factors are more frequently present in the first than in later labors. Massage and pressure do not help these cases, but better results are obtained by the use of a well-fitting pessary and care in emptying the bladder and bowels. The author concludes that retroflexion before labor is more frequent than had been thought, retroflexion from parametritis and perimetritis are more frequent than has been supposed, and the continuous position of the patient on the back after labor, combined with an overfilled bladder, is a cause of retroflexion. In the last months of pregnancy, the fetal head presses down into the pelvis and causes a thinning of the cervical canal which remains after labor and tends to produce anteflexion or retroflexion. Manual replacement and massage are here of value.

GYNECOLOGY AND ABDOMINAL SURGERY.

Uretero-vaginal Fistulæ Following Abdominal Hysterectomy.
—Carlos Lepoutre (*Jour. des Sci. Méd. de Lille*, June 6, 1908) says that vaginal hysterectomy for cancer or fibroma is the principal cause of uretero-vaginal fistulæ. Abdominal hysterectomy for removal of a large cancer or a laborious operation done for adherent salpingitis or for complicated fibromata is also a cause of this unfortunate condition. Here the ureters are often involved in the growth in such a way that it is almost impossible to tell their location. The flow of urine from the vagina, although the symptom that gives the patient the most trouble, is not the gravest one. The entrance of the ureter into the vagina is far from an ideal one. There is generally a tortuous, granulating tract between these organs that may become contracted and cause retention of urine in the pelvis of the kidney. The ureter itself becomes dilated and the walls indurated with a marked periureteritis. Clinically, there is a diminution in the amount of urine after some time and an impermeability of the kidney to methylene blue. Lumbar pain and nephritic colic are frequent. The diagnosis is based on the symptoms and on exclusion. At first the amount of fluid escaping from the drains is marked and its odor is urinous. The patient finds herself continually soiled with urine night and day, sitting or lying down. At the same time there is normal micturition of the urine of the other kidney. Examination of the bladder shows that the urethra is intact. In the vagina there may be seen a small nodule in the wall from which the urine flows. A tampon placed in the vagina soon becomes saturated with urine. Using methylene blue is of value, since this shows the orifice more easily. The fistulous orifice can rarely be catheterized. Injection of a colored liquid into the bladder shows that this fluid does not appear in the vagina, and vesico-vaginal fistula is excluded. Examination

of the kidneys shows a large hydronephritic kidney and pain in the lumbar region. Cystoscopic examination determines the side from which the normal urine flows and ureteral catheterization shows the distance of the cut portion from the bladder which varies from two to five inches. The ureteral orifice on the cut side is elongated transversely, and no urine flows from it. It is open and very easily catheterized.

Pyosalpinx Opening into the Bladder.—Muller and Petitjean (*Gaz. des Hôp.*, June 18, 1908) say that salpingitis may rarely open into the bladder, a condition which does not bring about the healing of the tube, but exposes the patient to severe inconveniences and dangers. When a collection of pus arises rapidly in the pelvis, it is generally the result of a phlegmon of puerperal origin, and these abscesses are cured definitely in a few months. Pyosalpinx and dermoid cysts of the ovary which have suppurated are comparatively rare. Opening into the bladder is exceptional. At the time of opening there will be a crisis of fever, violent pain radiating in various directions, vomiting and vesical tenesmus. Then pus appears in the urine and the pain ceases. In purely vesical or pyelorenal pus there is an absence of this violent crisis and a preservation of the normal volume of the urine. Absence of polyuria indicates a renal lesion. Usually periods of relief alternate with violent crises of pain when the pus again empties itself into the bladder. A cure is seldom accomplished except by operative procedure. In some cases the general condition fails and symptoms of sepsis supervene or renal abscess may occur as a result of ascending infection. Diagnosis is generally difficult. Laparotomy with the extirpation of the adnexa is the only treatment that promises permanent relief. The author describes a case observed by himself.

Bleeding in So-called Chronic Metritis.—G. Ahreiner (*Arch. f. Gyn.*, Bd. lxxxv, H. 2) describes chronic metritis as an affection in which bleeding sometimes, but not always occurs, in which there is no appearance of a growth or of real inflammation, but simply an enlargement of the uterus. After reviewing the literature on this subject, the author concludes that almost all writers agree that in chronic metritis the walls of the uterus are thickened, the connective tissue is increased and the walls of the blood-vessels are sclerosed and thickened. The thickening of the vessel walls consists of an increase of the elastic fibers. Aside from this, the changes are seen only in women who have been pregnant at some time. Some mention the changes in the blood-vessels as the cause of the bleeding, others the increased connective tissue and still others a lessening of the muscular power. Opinion is not by any means agreed on the subject of the cause of the bleeding. The author has examined the specimens from five cases observed by himself. In none of them was there any lesion of the mucous membrane. All the uteri were thickened and enlarged. Small streaks of connective tissue were to be seen through the muscular tissue. Macroscopically, groups

of enlarged blood-vessels were seen on the serous surface. The increase in connective tissue was not very marked. All the elements were increased in amount about equally, but the elastic tissue more than any other. The greatest increase in elastic fibers was about the vessels, and under the mucosa where the vessels are few this increase was slight. The greatest increase was in the middle layer of the wall. Arteries as well as veins were markedly thickened. The author finds no relation between this process of thickening and inflammation. The changes in the vessels form a process of physiological sclerosis. He finds no cause here for the occurrence of bleeding. The effect of the vasomotor nerve action on the vessels is lost by the increase of the elastic elements. The veins are less contractile than the arteries. Of the uteri examined, three had caused hemorrhage and two had not. The changes were the same in all five. The muscular tissue loses its power of compression, and venous hyperemia and hemorrhage may result from any sufficient cause. The cause of the hemorrhage lies outside of the uterus itself. On this hemorrhage ergot has no effect. The author finds the cause of the bleeding in constitutional conditions; among which are anemia and chlorosis, any long-continued illness, such as those of the lung and their complications, typhoid and gonorrhoea. In some there may be a kind of local hemophilia. Any condition that increases blood-pressure may be responsible for hemorrhage, such as heart and kidney diseases, abdominal plethora and obesity. Any of these conditions may cause bleeding in a uterus in which the sclerotic changes have gone sufficiently far. The causes are then general, not local.

Use of Scopolamin-morphine Narcosis in Gynecology.—H. Sieber (*Zent. f. Gyn.*, June 13, 1908) gives the results of the use of scopolamin-morphine narcosis in eighty-eight cases treated at the Marburg Hospital. It was used only in patients with sound hearts and kidneys, and women with unstable nervous systems, in whom cyanosis and restlessness developed, were not considered suitable for this form of narcosis. The dose was from three to nine decigrams of scopolamin hydrobromide and one to two centigrams of morphine muriate injected subcutaneously. The first dose was given two hours before operation, the second one hour later and the third just before operation, not more than nine decigrams ever being used. When an increase of pulse frequency occurred, it was most marked on the evening of the operation and lasted not more than three days at most. There was a slight rise of temperature in some cases, which disappeared in two days at latest. When long-continued effect on the pulse was found, the author believes it was the result of the poisonous effect of the scopolamin on the heart. The resistance of the patient to infection was lessened and the prognosis less clear on this account. It is also often impossible to say whether the slight rise of pulse and temperature is the result of injection or of the drug, or whether there is a thrombosis, internal hemorrhage or simply poi-

soning. Absolute analgesia is not possible by this method. A few cases show hypalgesia. When a sufficient degree of analgesia is not obtained, it is necessary to use chloroform to complete the operation. In such cases we have the patient subject to the effect of four potent poisons—a condition which is not to be desired.

Flushing Intestine through Multiple Openings.—G. H. Monks (*Am. Surg.*, June, 1908) records his experiments upon animals and cadavers and the history of one case in which he flushed intestine in sections through multiple enterostomy openings. He advocates this procedure in the most desperate cases in which the bowels are greatly distended, and in which the patient, overwhelmed with septic or toxic products, will die unless immediate relief is afforded. The technic which he recommends is as follows: Make a median abdominal incision from the pubes to, or above, the umbilicus. Pick up a loop of bowel high up in the wound. Determine by reference to the root of the mesentery which is really the upper and which the lower end of this loop. Make an enterotomy wound in the loop. Allow gas and feces to escape, and insert the tube pointed downward into the gut. Allow warm salt solution gradually to distend a few of the loops below this opening. If the patient's condition will allow it, pick up the loop which is apparently the lowest of those distended, make a second opening, insert a second tube—this one directed upward—and allow the wash water to run out through the tube until it becomes clear. Cleanse and sew up the first enterotomy wound, and return to the abdomen that part of the bowel which has been washed out. Repeat this procedure as many times, consistent with safety, as may seem necessary, each time isolating and cleansing a segment of intestine lower down. If the patient's condition will permit further operating, fill the colon with salt solution from the lowest enterotomy opening, after inserting a rectal tube to remove any wash water or intestinal contents which may reach the rectum. Use great gentleness in all manipulations, and carefully avoid contamination of the peritoneum. If peritonitis is also present, the peritoneal cavity should be washed out thoroughly, before flushing the intestinal canal, and also after it.

Perforative Peritonitis.—John B. Murphy (*Surg. Gyn. and Obst.*, June, 1908) believes the results in the future in cases of general, diffuse, free peritonitis must be uniformly good. This estimate involves the assumption that the medical profession will make early diagnosis, will insist on early intervention, will limit its surgical procedures to the least possible handling and trauma consistent with closure of the opening and relief of pus tension, will limit the duration of anesthesia and the amount of the anesthetic, will shorten the actual time of operation, will insure, by drainage, the continued absence of pus tension, will eliminate the sepsis already in the blood, restore the blood-pressure and will inhibit absorption by position. The importance of the Fowler position both pre- and post-operative is underestimated. The

patient should be placed in this position as soon as the diagnosis is made and kept so until convalescence is well advanced. Proctoclysis is most important. The retention of fluid in the colon depends entirely upon the method of administration. The syringe should be raised above the buttocks just so far that one and a half pints will flow into the rectum in 40 to 60 minutes and should be refilled every two hours. Opium and coal-tar anodynes were not given in any of the author's reported cases. There were no deaths from the peritonitis *per se* in the series of 51 cases.

Primary Carcinoma and Sarcoma of the Vermiform Appendix.—R. H. Harte (*Am. Surg.*, June, 1908) has collected 92 cases of primary carcinoma of the appendix and adds 9 previously unreported cases collected by him. He says that primary carcinoma of the appendix is present in from $\frac{1}{3}$ of 1 per cent. to 1 per cent. of all cases operated upon for chronic appendicitis. Carcinoma of the appendix, especially of the basal or spheroidal-cell type, is a condition of early life, occurring generally between the age of 10 and 40. There is little tendency to metastasis. The disease appears to be slightly more frequent in females than in males. Acute and chronic inflammations are present and are responsible for the symptoms demanding operation. The growth, while localized, gives no pathognomonic symptoms. The fact that primary carcinoma of the appendix takes its origin in an inflammatory process forms a very strong argument for the removal of all appendices which show evidence of any irritation.

ITEM.

SIXTEENTH INTERNATIONAL MEDICAL CONGRESS.

Contributions to the Congress must be announced to the Secretary before January, 1909. It is desired by the Committee that the manuscripts should be in their possession by the 31st of January, 1909. It should be known that the time for the reading of a paper does not exceed twenty minutes and that manuscripts should be clearly written, as the correction of the proofs is attended to at the office of the General Secretary. Copies of the manuscripts will be returned by July 31, 1909. The General Secretary is Professor Emil Grosz, M. D., the address, Budapest, VIII., Esterhazy-utca 7. Arrangements are in good progress and the preliminary program contains the names of distinguished men throughout Europe and this country. Professor Osler writes that there is much enthusiasm. Arrangements are under way for an excursion to Constantinople returning by the way of Greece.

There will be no difficulty about physical accommodations for the members.

Blank forms of application for membership to the Congress and

for the presentation of papers can be had of the Chairman of the Committee.

J. H. MUSSER, M. D.

1927 Chestnut St., Philadelphia, Pa.

The membership of the committee is as follows:

Chairman, JOHN H. MUSSER, M. D., Philadelphia, Pa.

The President, H. L. BURRELL, M. D., Boston, Mass.

The President-Elect, W. M. GORGAS, M. D., U. S. A., Washington, D. C.

The Surgeon-General of the Army, ROBERT M. O'REILLY, M. D., U. S. A., Washington, D. C.

The Surgeon-General of the Navy, ADMIRAL P. J. RIXEY, M. D., U. S. N., Washington, D. C.

The Surgeon-General of the Public Health and Marine Hospital Service, WALTER WYMAN, M. D.

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DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

A PRESENTATION OF THE SUBJECT OF ARTIFICIAL INFANT FEEDING FOR THE GENERAL PRACTITIONER.

BY

GODFREY R. PISEK, M. D.,

Professor of Diseases of Children, University of Vermont; Adjunct Professor of Diseases
of Children, New York Post-Graduate Medical School, New York City.

THE year 1908 will always be a memorable one in the annals of infant feeding, because it witnessed the end of a long contest concerning the principles on which this subject has supposedly been based.

The science of infant feeding is comparatively new. It is only about twenty years ago that it had its inception and, taking into consideration the meager basic knowledge that was at hand and the number of theories that have had to be abandoned, the amount of progress made is really phenomenal.

It needed no argument to cause mother's milk to be taken as the standard of what an artificial food for infants should be, and for many years the aim was to make artificial human milk. All of the early and many of the recent text-books clearly teach this. It was supposed that the differences between human milk and the milk of the lower animals were correctly understood; that these differences were merely ones of percentage composition and reaction and that it was a comparatively simple and an easy matter to change cow's milk so that it would have the same composition and properties as human milk. The teaching was, essentially, that modifying milk was infant feeding. This idea was quite generally accepted for a time, but as it was watched in practice it became apparent that there was more to successful artificial infant feeding than reconciling the supposed differences between human milk and cow's milk. It was also observed that the theory of modifying milk was not applied in practice and that practically no one made up food for infants according to the theory of reconciling the supposed differences between human milk and cow's milk.

It has not been claimed that modification of milk is not a useful procedure, but it has been claimed that the teaching was too narrow; that human milk was not being made from cow's milk; that the same scientific principles could oftentimes be applied in more than one way; that it made no difference how the correct principle was applied so long as it *was* applied; that if one method failed and another succeeded there must be some reason for it, and that efforts should be made to ascertain the principle involved so that intelligent application of it could be made to other cases. Thus there arose two schools or beliefs concerning artificial infant feeding, and the discussions over the controverted points have made a voluminous literature which is bewildering to one who has not been a close student of the subject.

Now, progress in all the sciences and arts has been made not so much by theorizing as by systematizing observed facts and phenomena, and from these working out the laws and rules that applied to the subject. By observing the actions and properties of electricity, it has become possible to formulate the laws that govern its action under different conditions and utilize it for many practical purposes, although no one yet knows what electricity is. The same is true of infant feeding. The physicians who have become the most successful feeders and who specialize in this branch are not those who have been tied down by theory, but the men who could see things for themselves and who were willing to believe that methods of feeding which produced vigorous, well-developed infants must have a scientific basis, even if they did not know what it was.

The real progress in infant feeding has been made by these physicians, and from observations they have made concerning the nutritional habits of infants the general laws which govern all successful infant feeding have been worked out. That these laws are correct is corroborated by the fact that they are almost identical with the laws of nutrition worked out from experiments on lower animals where full control could be had and the animals killed and examined to determine the effect of each method of feeding.

To-day, the factors involved in the successful feeding of infants are as well established as the laws governing the management of electricity, but few physicians are acquainted with them because most of the teaching has been based on erroneous theoretical considerations and not on a system founded on experiment and clinical experience. The fact that many of the theories have

been erroneous is now recognized by many of the leading pediatricians, and it may be confidently predicted that from now on the subject of infant feeding will be not only taught differently, but it will be more simple and will appeal to the reason of the student, general practitioner, and even to the mother and nurse. It is hardly to be expected that an absolute agreement as to methods will be reached at once or that all who have held to the theory of making human milk from cow's milk will give it up, but the confusing cross-teaching will become a thing of the past.

Infant feeding is not a complicated subject, but it has been made so by not differentiating between the methods of modifying milk, which are innumerable and more or less intricate, and the principles of nutrition and the methods of applying them, which are few and simple.

To become a successful infant feeder one should have a clear idea of (1) the general principles of animal nutrition; (2) the peculiarities of digestion in infants and young animals; (3) the food materials which may be used in feeding infants; (4) the methods of preparing foods; (5) the indications and contraindications for different forms of food. With a working conception of these subjects, any physician may become a good infant feeder with practice.

GENERAL PRINCIPLES OF ANIMAL NUTRITION.

The living tissues of the human body are composed of cells, each of which is constructed of proteids, a small amount of mineral matter and water. Each of these cells requires a small amount of proteid to make up for the constant loss of substance that is going on. It also needs a greater or less quantity of fats and carbohydrates to furnish energy. A small amount of mineral matter composed of phosphorus, iron and other substances is also required to make up for any loss there may be of these substances. It is therefore evident that if the cells are to be kept in normal condition or in good repair, so to speak, a supply of proteids is necessary, especially as proteids cannot be made from fats and carbohydrates. Growth consists in an increase in the number of cells of which tissues are formed, and as these are composed principally of proteids, if we except water, it is apparent that infant feeding centers around a supply of proteids. If too little proteids are supplied, proper tissue formation cannot take place. In a few words, growing animals particularly need a liberal supply of proteids and mineral matter for construction purposes,

a smaller quantity of these substances to make up for loss, and enough fats and carbohydrates to supply energy and to allow the storage of a moderate amount of fat, which is a reserve supply of heat and energy.

The natural foods of all species of animals contain more or less proteids, mineral matter, fats and carbohydrates. No matter how widely the forms of food eaten by different kinds of animals may differ, they will be found to contain these essential basic nutritive elements. The problem of nutrition is the same in all animals as far as the principle goes, but there is a great variety of methods by which the necessary food elements are obtained and digested, each species having organs specially adapted for securing and digesting its natural food. This leads to the consideration of the different forms of food supplied to young animals and to the processes of digestion in the young of different species.

PECULIARITIES OF DIGESTION IN INFANTS AND YOUNG ANIMALS.

Most young animals at birth are still in the embryonic condition; that is, they are still dependent upon the mother's body for nourishment. In fact, in most cases they are as much so as before birth. The digestive organs are not ready to assume their permanent functions immediately after birth, as are the lungs and kidneys, but undergo a process of growth and development of function for a considerable time after the young animal is born. During this period of development the difficulties of infant feeding are encountered. The mother's milk is generally perfectly suited to the developing digestive apparatus, and if it is not, regulation of the mother's habits and diet will often make it so. The question now is, why is mother's milk so perfectly adapted to the young animal, and why does not food that contains the same quantities of proteids, mineral matter, fats and carbohydrates as mother's milk, and which during the latter part of the second year and ever afterward is digested easily and produces well-developed tissues, agree with the young during the first year of life? The answer is that young animals have digestive organs that are not adapted to such forms of food, although they can and will develop so as to be capable of digesting them. While the digestive organs are developing, the mother supplies a form of food that not only is nutritious, but which readily changes its form in the stomach to meet altered conditions that are produced during development. There can be no greater mistake than to suppose milk to be a food of definite form or to

think of it as being always the same in its reaction to the digestive processes. Milk is a liquid when we see it, but as soon as it comes in contact with the digestive secretions, it changes into solid form. Long before weaning the stomach is at work on solid food produced by the action of the gastric secretions on the casein of the milk, but because it is out of sight we are apt to forget that this is so. The solidity of the food produced from the casein of milk depends upon a number of factors. When the stomach is feeble and the gastric process is not established, the milk forms the most delicate jelly, not much more dense than thin starch paste; but as the secretion becomes stronger and more active it causes the milk to assume a denser form, and when acid is secreted in any amount, the milk becomes decidedly solid. Not all milks produce the same kind of solid under the action of the gastric secretions. If they did, the difficulties in artificial infant feeding would be few. As was stated previously, each species has organs of digestion specially adapted for its natural food, and as the process or method of digestion differs with the species, it is not surprising that it is found that the milk of each species has the peculiar property of forming a solid food suitable for the developing digestive organs to which it is applied. Nearly all of the methods of modifying cow's milk that have been proposed have in them some factor connected with modifying the action of the gastric secretion in forming a solid food from the milk. This factor is often unconsciously disguised under the name of changing the reaction of the milk or reducing the percentage of proteids, decalcifying the milk and in various other ways. When it is known that all of the processes have a common purpose and effect on the milk, the practitioner will not only be able to use them intelligently, but to discriminate as to which one of the above plans he will use, as oftentimes better results can be obtained by one method than by another.

FOOD MATERIALS USED IN INFANT FEEDING.

The materials used in preparing food for infants are, in order of their importance, milk, cereals, sugars, broths made from meat, and eggs. Milk is absolutely essential for furnishing a more or less solid food for the developing stomach. Sometimes cow's milk alone will make a suitable food for some infants, but as a general rule, it must be modified or adapted to the particular infant. It is of little use to familiarize one's self with a method or with methods of modifying milk unless the indications for different

modifications are also learned. Too much stress has been laid on *how* to modify milk and too little on *why* the milk should be modified.

The cereals are to young plants what milk is to young animals, and furnish a highly nutritious food for protoplasm. They are rich in proteids, mineral salts and carbohydrates.

The different forms of sugar furnish a supply of energy *only*, and can produce nothing but fatty tissue.

Broths made from meats are of value in sickness when other forms of food must be discontinued temporarily. They also serve an extremely useful purpose in flavoring gruels which might become tiresome if continued for any length of time.

Eggs furnish a temporary food in some forms of sickness and are useful additions to the diet at the weaning period.

METHODS OF PREPARING FOODS.

Giving infants some form of food that will be retained and cause gain in weight is not necessarily good infant feeding. The food must contain enough proteids and mineral matter to repair waste and produce new tissue, and enough fats and carbohydrates to supply energy, except, of course, when the infant is sick or suffering from indigestion, when it may be necessary to give temporarily a one-sided diet. It is therefore of importance to know approximately how much of each of the essential elements of nutrition the food contains. The physician is not doing justice to his little patient if he dismisses him before getting him on a diet that contains enough of each of the food ingredients to produce proper growth, and he cannot know that the food is of proper nutritive value unless he is familiar with its composition. Again, the suitability of food cannot be judged by its composition alone, and too much importance should not be attached to analyses of foods. These analyses show only the *possible* nutritive value of the food if the infant can digest and assimilate it. The first consideration, therefore, is whether or not the food is *adapted* to the infant's digestion. If it is not, no matter how nutritious the food may be to older children or to adults, it has little nutritive value for the infant, and the analysis is misleading. A food, then, must be selected that the infant can digest. After this has been found, it must be seen to that it contains sufficient of the different food elements to enable proper development to take place.

From the foregoing it will be seen that intelligent preparation of food hinges on a knowledge of what ingredients, composed of

milk, cereals and sugars, to use to obtain any desired combination of proteids, mineral matter, fats, carbohydrates and water, or to know what quantities of these elements the food contains when it is known what amounts of milk, cereals and sugars were employed in making up the food.

Whenever possible, milk bottled at the dairy should be used. It should be the mixed milk of a herd of cows, and Jersey milk should be avoided, as it is too rich in fat and varies considerably in fat content owing to the rapidity with which its cream rises. For this reason, milk of one bottle may be much richer in fat than that of another bottle.

Good bottled milk as delivered to families will contain about 4 per cent. fat, 5 per cent. carbohydrates and 3.2 per cent. proteids. After the cream has risen, as it will do within a few hours after bottling, the top fifteen ounces will contain the same quantities of carbohydrates and proteids as the original whole milk and 8 per cent. of fat, while the top nine ounces will contain the same quantities of carbohydrates and proteids and 12 per cent. of fat. These top milks may be readily removed from the milk bottles by the one-ounce Chapin dipper devised for this purpose. These may be had at druggists for a few cents. By taking a different number of ounces from the top of the bottle, milk containing 5 per cent., 6 per cent., 7 per cent., 10 per cent. or any other percentage of fat may be obtained. These percentages are not absolutely accurate, but answer all practical purposes. Some writers assume milk to contain 3.5 per cent. of proteid, but this is a little high for the general run of milk. Nothing but an analysis of each specimen of milk could insure absolute accuracy, but this is unnecessary.

In all modifications of cow's milk it is diluted, so by dividing the composition of the original whole milk or top milk by the number of times it is diluted, the percentages of the ingredients in the diluted milk will be found. For instance, if a mixture contains one-fourth of whole milk, top 16 ounces or top nine ounces, the percentage composition of the mixture will be:

(a) Whole milk = 4% fat, 5% carbohydrates, 3.2% proteids divided by $\frac{1}{4}$ = 1% fat, 1.25% carbohydrates, 0.8 proteids.

(b) Top 16 oz. = 8% fat, 5% carbohydrates, 3.2% proteids divided by $\frac{1}{4}$ = 2% fat, 1.25% carbohydrates, 0.8 proteids.

(c) Top 9 oz. = 12% fat, 5% carbohydrates, 3.2% proteids divided by $\frac{1}{4}$ = 3% fat, 1.25% carbohydrates, 0.8 proteids.

The amount of proteids in the food is regulated by diluting whole milk or top milk, and the amount of fat by using more or less from the upper part of the bottle of milk. Infants nearly al-

ways require about 7 per cent. carbohydrates in their food, and as whole cow's milk contains less than this quantity, carbohydrates in one form or another must be added to the diluted milk. Thus the whole *process* of preparing milk or food for infants is seen to be very simple. Many different methods of calculating the ingredients of milk mixtures have been proposed, but they all have a common purpose, and the most elastic and simple method is best.

There have also been devised measuring glasses for putting up a few fixed modifications of milk intended to be used at certain ages. In practice these are often found to be unsatisfactory, as the formulæ are inelastic and tend to take the management of the feeding of the infant out of the physician's hands and lend themselves to unjustified attempts at increase in strength of formula by the mother.

There can now be obtained a graduate for measuring directly for percentages of proteids and fats of cow's milk, which is known as the Deming percentage milk modifier, which has rendered unnecessary calculation of either the quantities necessary to make up any desired percentage composition or to calculate the percentages from quantities that have been used. Its especial advantage is that proteids can be varied by small fractions, even as low as .20 per cent. at a time, and any desired percentage of fat can be obtained with each percentage of proteids, the milk used being taken from the ordinary quart bottle of milk. This graduate is to percentages what the ordinary graduate is to ounces and is used in the same manner. It does not put up stated formulæ and cannot be used without directions from a physician. It is of little use to the physician who wishes to turn something over to the mother to use "according to directions," but it will be found of great help to the physician who wishes to control his patient and yet save himself the mathematics of milk modification and writing out directions every time he wishes to make a change. The writer has tried many of these modifiers with all classes of patients, and has found that the dispensary mother can use them as well as the more intelligent parent.

The cereals employed in infant feeding are principally barley, oats and wheat, and they are used in the form of gruels. Since their value in infant feeding has become more fully recognized, they are being used more intelligently, and the tendency is to prescribe gruels of definite composition instead of the haphazard gruels of the past. Gruels have been made of pearl barley, pre-

pared barley flour, oatmeal and rolled oats, but their composition is uncertain and varies with the length of time they are cooked.

This has been shown by Chapin, in his article on "Standardization of Gruels," and also by Ladd, in a more recent article on the "Need of Greater Accuracy in Prescribing Starch." For this reason, the author uses the standardized gruel flour of the Cereo Company. When these flours are used, it should be recollected that the gruels contain a higher percentage of proteid than those made from pearl barley or the ordinary barley preparations.

In making the gruels, the flour should be stirred *into* the water instead of making a paste with a little water, because the proteids form a glutinous mass that dissolves very slowly when water is poured on the flour.

Such gruels are used in making modified milk and greatly increase the quantity of proteids in the mixture, and thus serve a useful purpose in furnishing material for tissue building, which would not be available if the milk was modified with water. They are also used without milk in gastrointestinal cases. Many times it is advantageous to dextrinize the gruels, by which process the starch is liquefied and converted into dextrin and maltose. This is accomplished by adding to one quart of gruel, when it is cool enough to be tasted, a teaspoonful of some preparation of malt diastase, such as cereo, which is made for this purpose. After the gruel thins, as it will, there will remain a flocculent mass consisting of the proteids of the cereal and the capsules of the starch grains.

Broths.—Mutton, chicken and veal are the broths used. A pound of lean meat is chopped finely and put into a pint of cold water. This is slowly cooked down for three hours to half a pint. It is then strained, cooled and the fat removed. The broths will be gelatinous when cool.

INDICATIONS AND CONTRAINDICATIONS FOR DIFFERENT FORMS OF FOOD.

When the physician has full control from the beginning; when the infant must be artificially fed from birth or when it first becomes necessary to feed artificially, the establishing of a successful diet is not difficult, and the following feeding scheme will serve as a guide. Perfectly normal infants differ in their tolerance of different forms of food and slight changes in the character of their food often produce remarkable results. For this reason methods of preparing a variety of foods are given.

TABLE No. 1.
SUGGESTIVE FEEDING SCHEME FOR NORMAL CHILDREN.

Age	Size feeding	Feeding intervals	Milk	Diluent	Milk sugar	Proteids (per cent.)	Fats (per cent.)	Carbo-hydrates (per cent.)
1-3 weeks	1-2 oz.	2 hrs. (9 feedings)	Remove top 16 oz. from one quart; use of this 2 oz.	14 oz. water; or 14 oz. plain gruel; or 14 oz. dextrinized gruel (made with 1 oz. flour to the qt.)	3 level tablespoons 2½ level tablespoons 2½ level tablespoons	.40 .82 .82	.80 .80 .80	6.50 7.00 7.00
3-4 weeks	2 oz.	2 hrs. (9 feedings)	Remove top 16 oz.; use of this 5 oz.	16 oz. water; or 16 oz. plain gruel (1 oz. flour to the qt.); or 16 oz. dextrinized gruel	3 level tablespoons 2½ level tablespoons	.80 1.16	1.80 1.80	6.70 7.00
2-3 mos.	2-4 oz.	2½-3 hrs. (7 feedings)	Remove top 16 oz.; use of this 12 oz.	20 oz. water; or 20 oz. plain gruel (2 oz. flour to the qt.); or 20 oz. dextrinized gruel	4½ level tablespoons 1½ level tablespoons	1.20 1.80	2.60 2.60	7.00 7.00
3-5 mos.	4-5 oz.	3 hrs. (6 feedings)	Remove top 16 oz.; use all of this	16 oz. water; or 16 oz. plain gruel (2 oz. flour to the qt.); or 16 oz. dextrinized gruel	1½ level tablespoons 4½ level tablespoons 1½ level tablespoons	1.80 1.60 2.00	2.00 3.50 3.50	7.00 7.00 7.00
5-7 mos.	5-7 oz.	3 hrs. (6 feedings)	Remove top 20 oz.; use all of this	20 oz. water; or 20 oz. plain gruel (2 oz. flour to the qt.); or 20 oz. dextrinized gruel	1½ level tablespoons 5 level tablespoons 3 level tablespoons	2.00 1.60 2.00	3.00 3.00 3.00	7.00 7.00 7.00
7-9 mos.	8 oz.	3 hrs. (6 feedings)	Use 2 quart bottles. Remove 24 oz. from each; use 36 oz. of this	12 oz. water; or 12 oz. plain gruel (2 oz. flour to the qt.); or 12 oz. dextrinized gruel	4½ level tablespoons 3 level tablespoons 3 level tablespoons	2.40 2.60 2.60	3.70 3.70 3.70	7.00 7.00 7.00

TABLE No. II.
SUPPLEMENTARY MODIFICATIONS OF THE FOOD.

Colic and no curds in the stools	(a) Add 1-2 tablespoonfuls lime-water to each feeding; or (b) If using plain gruel diluent, dextrinize; or (c) Add 1-3 grs. citrate of soda to each feeding; or (d) Use whole milk instead of the top milk to reduce fats, or pasteurize.
Colic and curds in the stools	(a) If using water diluent, reduce quantity of sugar and try gruels. (b) Add 2-5 grs. bicarbonate of soda to each feeding; or (c) If gruels disagree, use water diluent.
Vomiting.	(a) Examining the feedings—may be souring. (b) Temporarily dilute the food. (c) Use whole milk or skim-milk in place of top milks. (d) Add lime-water or bicarbonate of soda as above.

TABLE No. III.
CASES PREVIOUSLY IMPROPERLY FED.

Previous feeding	Fault	Remedy
Condensed milk	Too high carbohydrates; too low proteids	Begin with weak fresh-milk modifications; use cane-sugar instead of milk-sugar.
Proprietary foods	Generally high carbohydrates; too low fats and proteids	Begin with modified fresh-milk mixtures appropriate for a younger infant. If scorbutic, give $\frac{1}{2}$ oz. orange-juice daily between feedings.
One-sided diet	Excess of one ingredient or badly balanced	Cautiously increase the deficient ingredient.

TABLE No. IV.
DIFFICULT FEEDING CASES.

	Begin with	Subsequently	Finally
Marasmic infants	Legume gruels, 1-2 oz. to quart; plain or dextrinized with addition of 1 teaspoonful fresh pineapple-juice to 4 oz. of feeding.	Whey, alternating with legume gruel, and daily yolk of one egg rubbed up with $\frac{1}{4}$ teaspoonful cane-sugar at a feeding.	Weak-milk modification, with dextrinized gruel diluent. Peptonize if digestion still feeble.

TEMPORARY EXPEDIENTS.

Fresh milk intolerance	Dextrinized gruel pap: Well-toasted bread, 1 cup; gruel (strength of 1 oz. to quart), 1 cup; boiled milk, $\frac{1}{2}$ cup. Mix, dextrinize and bring to a boil.	Fresh unsweetened condensed milk: 1 part condensed milk to 6 parts water, with enough cane-sugar to sweeten.	Artificially prepared butter-milk.	Concentrated dextrinized gruels: (2 oz. flour to the quart) mixed with $\frac{1}{4}$ to $\frac{1}{2}$ meat broth.
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Gruel mixtures are richer in proteids than water mixtures, and should be used whenever they are well borne.

Dextrinized gruels contain no starch and they are preferably used during the first six months of life. Sometimes an infant will do better on plain gruel, and occasionally will not tolerate any kind of gruel. A physician is not justified in dismissing his patient until he has succeeded in placing it on a diet containing at least 2 per cent., and not higher than 4 per cent., of fat and $1\frac{1}{2}$ per cent. proteids, with 6 per cent. carbohydrates.

The specialist in infant feeding sometimes succeeds simply because he has paid attention to every detail connected with the preparation and administration of the food and because he has at his disposal a greater number of substitute foods, or because he knows how to modify the milk according to the principles laid down above in such a manner that they are nutritious, palatable and still do not produce digestive disturbance. It is for this reason that we have gone into considerable detail in this paper in the preparation of a greater number and variety of foods.

SUMMARY.

(1) All infants require a liberal supply of fats and carbohydrates to supply energy and heat and a small supply of proteids and mineral matter to replace the daily loss. If these are supplied, the infant can get along for considerable periods of time without showing bad effects, but successful development and growth cannot take place.

(2) For proper growth, a liberal supply of proteids and mineral salts in addition to the quantity needed to replace waste, is absolutely essential, for while gain in weight may result from the conversion of fats and carbohydrates of the food into body fat, growth or the formation of blood and tissue cannot occur unless there is more proteid and mineral matter in the food than is needed to replace loss. The development of the infant rests on the proteid supply.

(3) A portion of the proteids of the food for healthy infants must be in the form of milk, as this is changed into a semisolid food in the stomach by the gastric secretions, which is the forerunner of solid food.

(4) All infants conform to the general laws of nutrition, and no infant is a law unto itself except in nonessentials and in its preferences for different forms of food.

(5) Varying the form in which the food elements are presented

has much to do with success in feeding, and feeding in difficult cases depends absolutely upon it.

(6) Infants differ to a marked degree in capacity for digesting and assimilating food. Some will be able to thrive and grow on a quantity of food on which other infants will not much more than hold their own.

(7) As each element of the food performs a special function in nutrition, it is important to know approximately the composition of all feeding mixtures employed, for excess or deficiency of one or all of the ingredients is attended with harmful results if continued for any length of time.

(8) The raw materials for making up food for infants under all conditions consist almost exclusively of cow's milk, milk-sugar, cane-sugar and the cereals.

(9) The successful infant feeder is the one who can combine these substances in such a manner as to meet the peculiarities of each particular infant.

230 EAST SEVENTY-SECOND STREET, NEW YORK CITY.

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ANGIONEUROTIC AND SOME OTHER EXAMPLES OF ESSENTIAL EDEMA IN CHILDREN.*

BY

HERMAN SCHWARZ, M. D.,

Assistant Adjunct Pediatricist to Mt. Sinai Hospital, New York City.

BEFORE entering upon a discussion of the clinical portion of this paper, it would be wise to state in brief some of the prevailing theories as to the physiologic and pathologic factors which enter into the formation of both local and general edema. So much has been written about edema that a consideration of this in any but the briefest manner would occupy more space than I am allotted.

The most recent and complete exposition of this part of our

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subject is the first Harrington lecture on edema, delivered by Meltzer at the University of Buffalo, in 1903. Cohnheim and Lichtheim (quoting from Meltzer) wished to prove that plethora can lead to subcutaneous edema. They introduced into the veins of rabbits and dogs large quantities of sodium chloride solution, at times more than one-half the weight of the animal; they found that this plethora led to ascites, to edematous swellings of all the glandular organs, but there was no fluid in the pleural cavity nor edema of the skin. There was a marked flow of lymph from the thoracic duct, but none from the normal peripheral lymphatics and veins. They found that these large infusions would cause an edema of any part of the body if the part were previously subjected to an irritation, such as exposure to the sun, immersion in hot water, application of iodine, etc. Most of these factors cause a slight superficial inflammation. Cohnheim has shown that a change in the permeability of the vessel wall is one of the most essential factors in the production of inflammation. He believes, therefore, that the mild irritation causes a certain alteration of the capillary walls, which makes them more permeable. He assumes that the capillaries of the abdominal viscera are more permeable than those of the skin, and the plethora, produced by the intravenous salt injection is sufficient to cause transudation through the visceral capillaries, but insufficient for the less permeable skin capillaries. Acute hydremia, according to Cohnheim and Lichtheim, causes no transudation, for when they substituted a large part of the blood of an animal by an equal quantity of salt solution, there was no transudation in any part of the body and no edema. A repetition of this, however, for a number of days proved instrumental in producing edema, after tying the femoral vein. Chronic hydremia very likely leads to an increased permeability of the vessel wall. The retention of sodium chloride in nephritis has given importance to the theory of the osmotic pressure of the tissues for the formation of edema. It is possible that in renal diseases chlorides retained in the tissues attract water in abnormal quantities and thus cause edema. The relation of the nervous system to edema is also discussed by Meltzer. The removal of the influence of the vasoconstrictors to a part does not cause edema, but it certainly helps; ligation of the femoral vein alone also does not cause edema, but as soon as the sciatic nerve is cut in addition to ligation, edema occurs. Active vasodilatation has to be assisted by some other potent factor before

edema is produced. The angio-neurotic edemas are probably of this type.

When we have an intoxication due to the ingestion of certain articles of diet well known to produce urticaria, the procedure is somewhat as follows: Toxic substances from these ingests floating in the blood have been shown by Heidenheim to act as lymphagogues. There is an increase in the lymph pressure in the thoracic duct, and when for some reason vasodilatation of a portion of the skin occurs, local edema will result.

Summing up the part which the nervous system plays in the causation of edema, Meltzer says: "As far as the vasomotor nerves are concerned, they effect edema by influencing the intracapillary pressure and possibly also by influencing the lymph capillaries."

Fairbanks (4), in an article on "Hereditary Edema," published in 1904, goes over much the same ground with a fairly complete literature.

Quincke (5) describes the causation of the various forms of edema in his usual clear and concise way. He says that the causation of edema can best be studied by observations upon local edema. These he divides into three groups:

(a) Congestion due to an obstruction in the venous system, as in obstruction of the vena cruralis; hydrops mechanicus. In the capillaries the pressure is raised and transudation increased; the capacity of the lymph system fails and edema occurs. At times it also happens when there is direct lymphatic obstruction, as in extensive extirpation of the inguinal glands.

(b) Due to disturbances, of innervation, as, for instance, in hemiplegia; hydrop neuroticus; on account of the muscular paralysis, there is change in the circulation consisting usually in a slowing of the blood-current, but an increased permeability of the capillaries must also be borne in mind, due, no doubt, to disturbances in their nerve supply. In this group may be classed some of the acute circumscribed edemas and the menstruation edemas.

(c) Local edema due to some irritating substances, such as insect bites, which Quincke calls hydrops toxicus. Although a certain amount of edema and pain accompany these swellings, they resemble very closely a true inflammation, but the swelling is so much in the foreground and it is so transient that it can thus be differentiated from an inflammatory process.

Quincke then goes on to say that the same conditions which

bring on local edema play a great rôle in the causation of general edema, which, by the way, is rarely general, but really represents multiple spots of local edema or very extensive local edemas.

Clinically, the general edemas can be divided into three great groups—cardiac, renal and cachectic—and perhaps a fourth group in which cases are placed which cannot safely be put in the above three. These Quincke calls “Essential edemas,” and it is to them I wish to call your attention. These edemas lead one to suspect a local change in the tissues. The changes need not be present in the same degree or in the same portion of the anatomy in the various diseases in which they occur. In many cases there need not be actual edema, but a soggiess of the tissues and an increase in the body weight. In this sense may be placed the increase in water in the tissues during sleep, demonstrated by Quincke (6). By the experiments of Magnus (7) it was shown that if animals were chloroformed or poisoned with arsenic and chloral and an artificial plethora produced, an edema would result, thus showing that poisons and, no doubt, bacterial and other toxins play a rôle in the production of this form of edema. Summing up, Quincke says that these local toxic edemas may be caused by:

(1) Local action of the poison upon the vessel wall or upon the tissues themselves or upon both.

(2) Action of the poison upon the nerves either central or peripheral, these may be the nerves going to the vessels, vasodilators and trophic nerves or nerves which supply the tissues themselves or both.

In the clinical portion of this paper, which is now to follow, I do not intend to mention all the varieties of essential edema, but only those which I have had the good fortune to see.

CASE I.—The first case which I wish to describe was in a boy 12 years of age. He started with a typical scarlet temperature rising abruptly on the first day to 104 F. with a general eruption. Then followed 7 days of an ordinary fairly mild scarlet fever. During this time the urine was examined only for albumin, and it was found to be perfectly normal. On the sixth day, the temperature ranged from 99 to 100; general condition good, heart normal, no medication. On the twelfth day, there was noticed a slight puffiness of the eye-lids and some edema of the scrotum. A complete examination of the urine was then made and was entirely negative, both chemically and microscopically. The edema increased, and by the eighteenth day it was fairly general. The face was not markedly involved, but it certainly was edematous. The extremities and scrotum pitted easily. To cite at some

detail, I would say, from February 10 to 16 he appeared to be a perfectly normal convalescent scarlet-fever patient. On this day slight edema of the eye-lids and scrotum was noticed. Urine acid, 1024, no albumin or sugar. Microscopical examination negative. The albumin tests made were the heat and acetic acid, potass. ferrocyanide and the picric acid tests.

February 16, 17 and 18, edema increasing and covering the entire body, the face least of all.

February 20, edema about the same. Heart sounds of good quality, no enlargement, no murmurs. Pulse 90. Amount of urine in twenty-four hours, 800 c.c. On caffein sod. benz. gr. iii every four hours.

February 22, edema getting less, feeling very good, pulse good; urine negative, 900 c.c. in twenty-four hours. Hemaglobin 70 per cent., slight desquamation.

March 1, edema entirely gone. Slight desquamation. Uninterrupted recovery followed.

In July, 1904, urine again examined and found negative. I am sorry to have to add that in January he developed a lobar pneumonia following severe grippe. During this he passed only a moderate amount of urine—about 600 c.c. in twenty-four hours—and died on the ninth day of cardiac failure. His urine showed albumin and hyaline and granular casts. An autopsy was not permitted. There was no edema.

Quincke (8), Hensch (9), Senator (10) and Rillet and Barthez (11), Steiner (12), Filatow (13), Litten (14) and others have described cases of edema following scarlet without the appearance of albumin and casts in the urine. Many authorities give exposure to cold as a cause for these edemas. Filatow says that in these cases there is no albumin in the urine, the skin is not pale, recovery is rapid and absolute and there is always cardiac weakness. They occur most frequently after scarlet between the 10th and 20th days and the last 15 days. They are not due to nephritis, but to two causes: (1) an increased permeability of the vessel wall, probably due to some poison, and, secondly, to cardiac weakness. There may be rare cases where there is a latent nephritis, and the patient goes on to uremia. Litten, on the other hand, denies that these edemas occur without nephritis, and bases his belief upon a case observed by him, which, in spite of the absence of albumin, showed a severe nephritis at the autopsy.

In our case it was most unfortunate that it was impossible to get the kidneys in order to see whether there was a nephritis present at the time of the scarlet and thus the cause of the edema, or whether the changes in the urine at the time of the pulmonary infection were due to an acute and not a chronic affection of the kidney: It seems to me that there might have been some in-

volvement of the kidney in the first instance and thus causing their insufficiency when the subsequent infection occurred.

CASE II.—The second case is similar to the preceding one only in the fact that it occurred in connection with scarlet fever, but not quite in the same way as the above, and is hardly to be put down to the same etiological factor. It occurred in a girl, H. H., 19 months old. Breast fed, until fourth month, then bottle fed. Measles when five months old when another child in the family had measles. Six weeks previous to the first examination, the child had a rash which lasted two days. This was limited to the body and extremities, punctate in character. Temperature ranged from 101 to 102. There was no desquamation. The physician treating her at this time assured me that there was no albumin in the urine. Three days later, the glands in the neck were swollen, and were still enlarged when I saw her. One week after appearance of the rash, the right ear began to discharge. After this there was an evening temperature of 102. For this the doctor gave quinine, thinking it might be malaria. He gave one grain repeatedly from the eleventh of March, 1906, to the eighteenth, about twenty grains in all. On the morning of the eighteenth, the right foot became swollen, then the left became involved. I saw the child on the afternoon of the eighteenth. Temperature 102, left hand brawny, infiltrated, reddish hue, evidently tender. The terminal phalanges not swollen, the plantar and dorsal surfaces of both feet similarly affected. The mother told me the other hand was also very much swollen, but had gone down since the morning. The upper lip was also swollen. In the evening the left side of the face was swollen. No difficulty in swallowing. Swelling on the left hand extending to the elbow. Heart, lungs, liver and spleen negative. Urine acid, 1018, no albumin or sugar, microscopically negative. The next day swellings all gone, temperature 99. Urticarial spots and itching present. For the following ten days there was no temperature or added swellings. Needless to say, the quinine was stopped. The child was seen again one month later. Urine absolutely negative, no additional swellings. There is very little doubt as to the diagnosis being one of giant urticaria, not of angioneurotic edema or nephritis. It is interesting from the fact that (1) it followed the scarlet fever so closely and probably the scarlet causing the skin capillaries to be less permeable; then on the addition of the toxic agent in the form of the quinine giving rise to the edema. Concerning the temperature in this case, I might say that in all probability it was due to the enlarged cervical glands, yet the quinine as a factor in the causation of temperature, as shown recently in a case of Goodman's (16), must also be remembered.

CASE III.—The third case I wish to bring before you is in the same group of edemas, but one rarely met with and apt to be very puzzling. It occurred in a four-weeks-old female, C. McG., second child; first child perfectly healthy. Mother has had no miscarriage. It was a normal easy labor, breast fed; icterus

neonatorum. Until the twenty-second day, it appeared to be perfectly healthy, when it had abdominal pain with some distention. At this time the mother noticed slight redness about the left leg, and a few days later the vulva began to swell, the feet then became involved and were red and tender. On the eighth day, the left arm began to swell. No vomiting or diarrhea, no cough or dyspnea, some fever present the first few days. On February 26, 1906, the child was brought to the clinic and showed the following status: Well nourished, temperature 99, slight erythema over lower part of trunk, more marked on lower extremities, slight desquamation all over the body with exception of palms and plantar surfaces of feet. No edema of face, slight bogginess and edema of upper extremities, especially of the left. Marked edema of the vulva, edema of the lower extremities, especially the left. Skin of left leg red and evidently tender. Mother says both feet were more red and tender a few days previously. This edema pits easily on pressure. There is a small ulceration on the peroneal surface of the left leg, the remains, the mother says, of a bleb. Viscera entirely negative, heart showed no murmurs, spleen not palpable. Urine catheterized, specimen negative to albumin and only a few flat epithelial cells microscopically.

Seen again February 27 and 28 and March 1. General condition excellent and edema gradually disappearing. Urine negative, hemoglobin, 80 per cent. March 5, edema almost gone, a trace still present in the vulva. Quantity of urine not measured, but mother says the child urinates very frequently and wets the diaper considerably when she does so. Ulcer on leg healing rapidly. March 10, the edema had entirely disappeared, the urine was negative.

The causation of this edema perplexed me very much, for there was no marasmic condition present, and the intestinal tract was normal. Finally I hit upon the fact that the child had been through an attack of erysipelas, probably starting from the vulva or anus. She had marked redness and swelling of the skin with formation of bullæ, followed by desquamation. In looking up this question I found just this condition of general edema following erysipelas described by Henoeh (17) and Finkelstein (18).

Both mention the fact that after the erysipelas is in the stage of defervescence and the redness of the skin has almost faded, there remains at times over the entire body, or a portion of the body, a well-marked edema, and where the doctor has not observed the case from the beginning he may have some trouble in discovering the cause; the slight erythema still present, the previous history and the desquamation usually lead one to the correct diagnosis. Somewhat similar to these cases, and possibly mistaken for them, are the cases of chronic idiopathic edema

of the genitals in young infants described by Fridjung (19). He reports the case of a male child prematurely born at seven months. At the third week there was noticed a swelling of the pelvis and scrotum without any inflammatory condition present. This edema extended about one-half way to umbilicus, involving especially the mons veneris. At the third month the condition was still present, the child doing very well, its general condition excellent. At the fourth month it had almost entirely disappeared. He describes a second case, also prematurely born and in a male child. It is only seen in male children and does not pit on pressure. The children are perfectly well and have no constitutional disturbance. Zappert describes similar cases, and explains them in his discussion of Halban's theory as probably due to some poison which by circulating in the blood of the mother affects the child. Finkelstein has shown that in idiopathic edemas of the new-born, streptococci may be found in the skin, and believes that those may be extremely mild cases of a streptococcus infection not going on to erysipelas. Infection of the prepuce does not cause these edemas, for in the balanopostitis of older children edema lasting months does not occur.

CASE IV.—The fourth case I will describe very briefly, for it is a rather common occurrence. I mean edema following malnutrition and gastroenteritis in young infants. Yet there are a few interesting points which make it well worth presenting.

Male infant on the breast three days, then milk one teaspoonful to two ounces of water and given every two hours, the entire quantity made up at once and a pinch of salt added. This was given for ten days, then child was given fennel tea and barley water because the bowels were bad, and this (fennel tea and barley water) was kept up for three weeks. Three days before I saw the child, the mother gave it half milk and barley water, four ounces every two hours, and put a pinch of salt into each bottle; then the child began to grow edematous—face, lower extremities and abdominal wall. Urine negative. On proper milk formula without salt the child soon recovered, edema disappearing completely.

It is interesting to note the fact that although the child had been on the outrageous mixtures of fennel tea and barley water for three weeks, it was only after the ingestion of so much salt that the edema occurred. Bryant (2) and Meyer (22) have reported cases of idiopathic edema due to excessive salt diet, the edema disappearing upon restriction of salt.

The fifth case is the most important of all—a case of angioneurotic, or, better, acute circumscribed edema.

CASE V.—I saw this case in Dr. Henry Heiman's clinic at the Mt. Sinai Dispensary and wish to thank him for his permission to publish it. When first seen, three years ago, the child, Pauline D., was eight years old. Family history negative, and close questioning fails to elicit any hereditary factor. No neuroses, no migraine, even urticaria unknown.

Past History.—Uneventful, with exception of diphtheria when 6 years old.

Present History.—When 6 years old began to have attacks of abdominal pain with vomiting, associated with edema of various parts of the body. These attacks occur at irregular intervals, but of late have been more frequent. The colic lasts twelve hours. The edema from twenty-four to seventy-two hours. Between the attacks no headache, no dyspnea or cardiac palpitation. Appetite good. Constipation.

Physical Examination.—Shows a rather poorly nourished child, anemic. Special senses and reflexes normal. Teeth and gums in poor condition. Throat negative. Moderate enlargement of the lymphatic glands. No dyspnea, no cyanosis.

Lungs, heart, liver and spleen negative. I observed her for a month in her home in a down-town tenement. Dr. Koplik was then kind enough to have her admitted to his wards in the Mt. Sinai Hospital. She was admitted October 14, 1905, during which time a number of attacks were observed and numerous blood examinations made, for which I am indebted to the house staff. To go more into detail:

October 15, 1904.—Pain and swelling of the left hand, the patient also complained of abdominal pain. These symptoms disappeared in 24 hours.

October 15 to 29.—Perfectly normal; oil given repeatedly and arsenic. White blood-cells 10,200. Temperature, 100 F. On this day swelling of right foot, pain, and skin has a faint reddish-purplish hue. Pain is constant, but worse on pressure. The swelling is not like true edema, for it does not pit on pressure. Urine is perfectly normal. Pain and swelling gone the next day.

November 1.—Pain and swelling of the right upper extremity. Below the elbow there is a diffuse swelling with a boggy feel, but not true edema. Temperature 100, urine negative, white blood-cells 11,200.

Polynuclears, 58 per cent.

Large lymphocytes, 13 per cent.

Small lymphocytes, 24 per cent.

Mononuclears, 2 per cent.

Eosinophiles, 2 per cent.

Mast cells, 1 per cent.

November 2 and 3.—The swelling has extended to the hand. The hand has a reddish hue and is rather stiff. The left hand and wrist similarly affected. Temperature, 100. Pulse, 100–112. Urine negative.

November 5.—Edema has disappeared.

December 16.—Severe abdominal colic followed by bile-stained vomiting. Epigastrium very tender. Cheeks slightly swollen. Normal temperature. Pulse, 124.

December 20.—Abdominal symptoms gone, and seems perfectly well.

December 27.—Polynuclears, 60 per cent.

Large lymph., 17 per cent.

Small lymph., 15 per cent.

Eosinophiles, 5 per cent.

Large mono., 1 per cent.

Basophiles, 2 per cent.

On the afternoon of January 2, 1905, began to complain of toothache on the left side. Soon after left cheek became swollen and slightly tender. During the night edema increased and spread over the neck. The lips were swollen. The child began to get cyanotic, there was loud crowing inspiration, marked supra- and infrasternal retraction, face anxious. This lasted for about one-half hour, during which time the house staff were getting ready to do a tracheotomy, but under Magendie's solution, the urgent symptoms gradually subsided, although the edema of other parts with dysphagia persisted. Vomited a few times.

Blood examination.—Polynuclears, 72 per cent.

Large lymph., 8 per cent.

Large lymph., 14 per cent.

Basophiles, 5 per cent.

Mononuc., 5 per cent.

Eosinophiles, 4.5 per cent.

On January 6, three days later, there is no difficulty in swallowing or in respiration. Out of bed January 8.

While in the hospital the various intestinal antiseptics and regular purgation were employed. Since this time I have seen the girl from time to time. The attacks continue, with abdominal pain alone or in combination with edema of various parts of the body. On April 7, while playing, suddenly became dyspneic and cyanotic and had attacks of edema of the glottis. In spite of an absolutely milk and vegetable diet, and regular evacuation of the bowels, these attacks recur. It is true while in the hospital under better hygienic conditions, the attacks were a little less frequent, yet I must confess that in my three years of observation I have not been able to discover the exciting cause.

The urine has been examined before and after and during the attack and has been absolutely negative with the exception of large amounts of indican; there was no acetone or diacetic acid present. During one attack there was quantitative estimation of the chlorides excreted in twenty-four hours. This was approximately 11 grams, being about normal.

The blood examination shows a considerable improvement in her general condition. Hemoglobin was 64 per cent., when first seen. It is now 85 per cent. Red cells, 4,300,000. White cells, 9200, 11,200 and 13,000. The eosinophiles were always

increased, especially when just getting over an attack. During one attack of facial edema, involving the eye-lids, the fundi were examined and an absence of edema noted and corroborated by Dr. Koller.

The vomitus during one of the attacks was collected and examined. Quantity was 200 c.c., alk. reaction and containing considerable coagulable albumin. Quincke and Gross (23) describe similar findings in a case with vomiting of 800 c.c. of fluid in an attack lasting twelve hours. During an attack of vomiting we have tried, but without success to follow Morris' example and obtain, by means of a stomach-tube, a portion of the gastric mucosa. He succeeded in doing this, and showed by histological examination that there was an edema present. The colic and vomiting is probably due to this local edema. Osler points to the fact that colic in horses is often due to hemorrhagic edema of the intestinal wall.

Since Quincke drew general attention to this form of edema, there have been many cases reported and the literature on this subject is voluminous. I shall be very brief in a general consideration of some of the more important features of the disease.

According to Cassirer (25), Quincke was not the first to describe the disease, but Milton (26), in 1876, described typical cases of angioneurotic edema under the title of "Giant Urticaria," but adds, as I will point out later, that these cases differ distinctly from the most severe urticaria. Joseph (27) says Stolpertus described it in 1778 and Erichson in 1801. Cassirer found it most common about the twenty-fifth year; Collins (28), at the twenty-seventh year. It is interesting for us to know that of 132 cases, 21 per cent. occurred in children under fourteen years. In many instances there is certainly a hereditary factor, as in Osler's cases, where the disease appeared in five generations; Talcone's (32) case, a boy of seven, whose grandfather had it; Schlesinger's (33) cases, where it occurred in five generations; and Ricochin's (34), where three generations were affected. The transmission is very frequently through the male line (Dinkelacher, Quincke, Osler). Some toxin, generated in the gastrointestinal tract, certain articles of diet, reflex nervous phenomena, immersion of the hand in cold water (Starr (39)), exposure to cold and anxiety are supposed to be exciting causes. Higgins' case is interesting; the child would get a swelling of right side of face whenever it ate anything sweet. The injection of diphtheria antitoxin, may be an exciting cause. Morse (35) mentions a case in which edema of the uvula and pharynx occurred five days after injection. Halderman (36) gave a prophylactic dose to a five-

year-old child; immediately the lips began to swell and edema of the glottis set in, death in five minutes. Ninfong (37) gave 1500 units to a fifteen-year-old boy; ten minutes later, extremities pale, cyanosis, swelling of face and vomiting, death followed. In the well-known case of Prof. Langerhans' child, that died immediately after a prophylactic dose of antitoxin, an edema of the uvula was found at autopsy. Whether these accidents can be explained by supposing the serum to be an exciting cause of an attack of acute angioneurotic edema or that the symptoms described fit to a certain extent with the so-called Serum-krankheit of Von Pirquet and Schick (38), is yet an open question. I have frequently asked myself whether I would give serum should my patient get diphtheria, and have answered it in the negative, providing the case was not a rapidly progressing one.

There are many cases of acute circumscribed edema, which have an unknown origin and have to be classed as idiopathic. The attacks may have a certain degree of regularity; at times they come on without a moment's notice and at irregular intervals, especially at night. Matas (40) reported a case which came on regularly in connection with the menstrual period.

The symptoms have been brought out in the typical case described. The skin may be perfectly normal, but usually there is a pinkish-white glassy appearance. The consistency is different from true edema, for although it may pit upon pressure, there is no lasting indentation. The parts are elastic. Some of the cases described by Quincke and Gross showed the skin perfectly normal, but the swelling involved the subcutaneous tissues, and even the periosteum and disappeared in twenty-four hours.

The involvement of the upper respiratory passages is interesting and important, especially to the pediatrician and the laryngologist. In the nose it resembles hay fever in the suddenness of its onset, but there is very little sneezing and no excessive secretion and it can thus be easily differentiated. In the larynx it constitutes one of the dangers of the disease, the attacks of edema of the larynx usually come on when asleep, but sudden dyspnea may occur at any time. Cases are described by Lederman (42), Chittenden (43), Taylor (44), Ballenger (45), Griffiths (46), and Osler. They must be differentiated from erysipelas of the larynx in which the pain, temperature and constitutional disturbance give the differential points. In the lungs it may give rise to attacks of acute edema. Herman Miller (47) cites a case where a woman had 115 attacks in three years, beginning usually during

the menstrual period, lasting from twenty minutes to one and one-half hours, accompanied with sweating and expectoration of up to 200 c.c. of frothy sputum. There were also swellings of the face.

The abdominal symptoms, colic, vomiting and diarrhea have been gone into before, but it is important that these cases should not be taken for appendicitis, peritonitis, renal colic, etc.

The kidney may also be involved, cases of paroxysmal hemoglobinuria (Joseph), when slight traces of albumin and even blood may be present. Some of the mysterious cases of hematuria may be in this category. There is probably a dilatation of the vessels of the kidney with exudation which is excreted through the urine. This would account for the polyuria and the slight traces of albumin present at times (Dinkelacher, Schlesinger, Ricochin).

As to the nervous system, there may be transient aphasia due to this transient edema (Quincke (50)). Hahn (48) describes a case of transient aphasia which lasted one week. Koplik (49) also describes acute edemas during typhoid, but these are very probably similar to those following scarlet fever; that is, purely toxic.

We come now to the diagnosis. In the typical cases there is very little difficulty. It is most difficult and important to differentiate it from giant urticaria. Milton, in his communication in 1876, says that it is distinct from the most severe forms of urticaria. With severe forms of urticaria there is usually, but not always, some temperature. There are smaller urticarial wheals present and, what is most important, there is an entire absence of the abdominal symptoms, such as are seen in acute circumscribed edema. Correction of errors in diet usually causes the urticaria to disappear, and if these errors are avoided it does not reappear. Cassirer thinks the diet has very little, if anything, to do with the true cases of Quincke's edema. A continuance of attacks, in spite of all hygienic and dietary measures speaks for the true condition. Yet there are cases where an exact diagnosis cannot be made, for there may be a combination of large swellings and of typical urticaria which have a habit of recurring.

Osler's symptom complex of exudative erythema with visceral lesions is closely allied to angioneurotic edema. Osler says that the attacks of colic, vomiting and diarrhea may be accompanied by various skin lesions, once the features of an angioneurotic edema, then in the form of an erythema multi-form, again those of a peliosis rheumatica, but the abdominal

ymptoms are always present, and the varieties of the skin lesion lead to the correct diagnosis.

In Basedow's disease we may have transitory edemas, with urticaria and marked itching; transitory edemas occur with the lightning pains of tabes. Purpura may be associated with transient edema. Further, we have the peculiar cases of congenital chronic edema, as described by Milroy (51). The hysterical edemas first described by Charcot and lately by Hans Curschman (52) can be differentiated by the marked hysterical history, and, according to Curschman, by the anesthesia over the edematous area and its chronicity.

The prognosis in these cases is usually good, the edema of the larynx being the only cause of death. These patients are ever threatened with this dire calamity. The abdominal symptoms are often very severe. Morphine seems to be the only thing that helps. For the edema of the larynx scarification, and the direct application of adrenalin to the edematous parts seemed to be of some service in one attack. Tracheotomy may have to be resorted to. Prophylactic measures are most important, including avoidance of articles of diet which seem to predispose and, above all, relief to any existing constipation.

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BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Necrotic Angina or Perforating Ulcer in Scarlatina.—Felix Langlais (*Jour. de Méd. de Paris*, June 12, 1908) describes a virulent form of scarlatina in which ulceration and necrosis of some part of the pharyngeal tissues, especially the pillars of the fauces or the palate, occurs, the case generally resulting fatally. The necrotic area appears at the time of the exanthem as a white patch that cannot be removed with the swab and that leaves a raw surface when a piece is taken away with the forceps. It generally begins on the tonsil and spreads to other structures. The tissue around it is swollen and of a deep-red color. The ulcer extends deeply into the tissue, and after perforation has occurred does not increase in size. The patient suffers from difficulty in swallowing and marked pain. The general condition rapidly becomes worse, with infected odor of the breath and sanious discharge from the mouth. The submaxillary glands are much swollen, albumin appears in large amount in the urine and diarrhea and dry skin are marked. The vault of the palate may be necrosed as may be the lower maxilla, with loss of teeth. The lips may be ulcerated and the tongue affected in the same way. Death soon follows intoxication and failure of nutrition. These cases are exceedingly contagious and should be carefully isolated. Treatment is of little avail.

Principal Causes of Death in Diphtheria After the Use of Serum.—Louis Martin (*Rev. Française de Méd. et de Chir.*, No. 11, 1908) has tabulated the causes of mortality in 853 cases of diphtheria treated at the Hospital Pasteur from 1900 to 1908. There were 83 deaths, of which 28 occurred within twenty-four hours of their entrance—that is too soon for the effect of antitoxin to be felt. This was especially the case in very young children in whom the diagnosis is very difficult. To avoid these deaths it is necessary to inject every doubtful case without waiting for the bacteriological diagnosis. Very young infants die in the proportion of about 20 per cent. They come generally from very dirty, contaminated surroundings. Preventive injection should be used in all cases of young children coming in contact with cases of diphtheria. Most of the older patients that die succumb later to toxic accidents that are generally attributed to nervous lesions; the author believes them to be the result of renal, hepatic and suprarenal incompetence. To prevent these later deaths it is necessary to reinject the patient as soon as symptoms of intoxication appear. Mixed infections are very fatal.

Urticaria After Second Dose of Diphtheria Antitoxin.—A. W. Blain (*Med. Rec.*, June 6, 1908) reports seven cases of urticaria following the use of diphtheria antitoxin. In all these cases the conditions were virtually the same—*i. e.*, the injection of antitoxin for immunizing purposes, and the second injection for a supposed diphtheritic infection which later proved to be only a tonsillitis with exudate, or simply a second immunizing dose. He concludes from his observations that the second immunizing dose of antitoxin should be given with caution, especially to individuals of the blonde type, regardless of how long previous the first was administered. Should an individual who has at some previous time received antitoxin be exposed to diphtheria, it is better, if the exposed person can be kept under observation, to delay the administration until symptoms of diphtheria appear. Diphtheria taken early and properly treated would be accompanied by as little danger and far less suffering than were some of the cases cited. In persons in whom an immunizing dose of antitoxin has been given and who later contract diphtheria, an attempt should be made to regulate the dosage in comparison with the severity of the infection, and not to push the serum too far and thus overneutralize the toxin, possibly producing this distressing condition.

Bacteriological Study of Perleche.—M. B. Auché (*Ann. de Méd. et Chir. Inf.*, June 1, 1908) says that this affection is named from the sensation of dryness of the lips which is produced, obliging the child to lick his lips continually. It has also been called *bridon*, from the word meaning to bridle, from the stiffness of the lips that it causes. It begins by an alteration of the epidermis of the commissures of the lips, which become white, macerated and slightly swollen. The lesion extends outward onto the lips from 1 to 2 cm. It increases in depth, and fissures develop in the commissures. It does not increase on the mucous surface of the lips. There may be a diphtheroid stomatitis associated with it, and rarely impetigo is present. The trouble is frequently epidemic and is considered to be infectious. Many examinations of the secretion from the patches have been made. Various forms of streptococcus have been found and also staphylococcus. The author publishes the histories and examination of ten cases observed by himself. The observations may be divided into two groups. The first group consisted of children who communicated the disease to each other, the second consisted of isolated cases. In ten cases the staphylococcus was found, in seven the staphylococcus aureus, in six the staphylococcus albus, once the colon bacillus and once an undetermined bacillus. That is, the staphylococcus was always present, either alone or with some other organism. This seems, then, to be the primary cause of the infection. The author believes that several varieties of staphylococcus may produce the same lesion.

Localized Thermotherapy in Rebellious "Growing Pains."—Rocher (*Ann. de Méd. et Chir. Inf.*, May 1, 1908) says that the

exact nature of "growing pains" is not yet fixed. According to some, they are due to a mild osteomyelitis; to others, they are rheumatic. When the hyperactivity of puberty comes on, the congestive phenomena produced, combined with a slight degree of infection, cause these articular pains. Others believe them due to an abnormal ossification. No fever is produced. There are present at the same time juxta-articular pains and an elongation of the skeleton. In all probability there is a hyperemia of the medulla of the bones. These pains may be of short duration and less intensity, or they may be so severe as to prevent the patient from walking and be rebellious to all forms of treatment. The author has found that great benefit is received by the patient from applications of dry heat according to Bier's method. The heat favors the regeneration of the tissue and influences the nutrition and physiological growth of the bone. The treatment is easy, rational and has excellent results. It is always grateful to the patient and relieves the pains very rapidly.

Periodic Vomiting.—J. S. Arkawin (*Arch. f. Kinderheil.*, Bd. lxxxiv, H. 1 and 2) says that all authors refer cyclic vomiting to the same etiological factors. Hereditary predisposition plays an important part; such diseases as gout, obesity, diabetes, calculus, asthma, migraine, brain and nerve troubles in the parents are hereditary factors. Kidney diseases are an important element. Many believe that an increased amount of acetone in the urine is important. In connection with acetone, some authors have found an excess of acetic acid. Some authors refer the condition to the formation of acetone in the system, while others believe this is to be simply a result of the condition present. The author gives histories of four cases which he has treated. In all there was a neuropathic predisposition. In these cases an improvement of the symptoms began as soon as the obstipation was relieved and the bowels had moved freely. The first stool was very bad smelling, the succeeding ones less offensive, and as they became better the odor of acetone disappeared from the breath. The treatment consists in attention to the diet and hygiene, hydrotherapy, carbonic-acid baths and plenty of fresh air.

Chronic Appendicitis in Children.—J. Comby (*Le Bull. Méd.* June 10, 1908) says that appendicitis is essentially a chronic malady in children and is rather frequent. It has lasted for some time and progressed slowly with a vague symptomatology when an acute crisis occurs which causes the diagnosis to be made. There are three classes of cases: in one the child is well nourished and has not suffered from indigestion or enteric symptoms. In these cases the author believes that there is a hereditary predisposition, a lymphatic, arthritic disposition. In a second category there have been frequent attacks of tonsillitis and rhinopharyngeal troubles, adenoids with otitis media, and cervical adenopathies. Symptoms of appendicitis appear later. A third set of cases has suffered from gastrointestinal troubles in early life. Mucomembranous colitis and cyclic vomiting are

frequent in these cases. Other cases seem to be dependent on attacks of infectious disease, especially influenza and typhoid. Any of the infectious diseases of childhood may determine attacks of appendicitis. Abuses of diet and peculiar tastes in food may be etiological factors. The disease is rare in nursing infants and becomes more frequent as the child advances in age. The anatomy may include any sort of appendix. The symptoms vary greatly. In many children there is a peculiar yellow complexion, combined with lack of appetite, emaciation and dyspepsia. There are a coated tongue, pains in the abdomen, not especially located on the right side, vomiting and obstinate constipation. There are circulatory disturbances and in older children nervous symptoms. The differential diagnosis must be made from enterocolitis, cyclic vomiting, hepatic colic, nephritic colic, movable kidney, salpingitis, oophoritis and dysmenorrhea. The prognosis is very variable. Treatment may generally be medical, with restricted diet, hygiene, attention to the condition of the bowels and rest. Many authors consider that an interval operation is demanded, since the occurrence of an acute attack with its attendant dangers is always threatening.

Immediate Treatment of Acute Osteomyelitis of Adolescents.—M. P. Hardouin (*Presse Méd.*, June 13, 1908) says that the primary lesion in osteomyelitis is in the medulla, but secondary foci may be propagated from this and pus collect under the periosteum. There may be a subperiosteal lesion that is limited to this situation, a primary abscess which is rare; or there may be a focus due to propagation from the primary central focus, a form that is frequent in acute osteomyelitis of the epiphysis. In the first form simple incision and drainage are sufficient. In the second, this would be quite insufficient, and would lead to terrible complications from the development of an intraosseous abscess. Trephining must be done at all risks. The difficulties can all be overcome and the dangers are no greater than those of the abscess itself. The diagnosis must be made rapidly and operation undertaken within forty-eight hours of the inception of the disease if we are to get the best results. Unfortunately, few such cases are brought to the physician in time. The symptoms are an enlargement below the knee-joint, with violent pain, increased by palpation. Rheumatism, localized in a single joint, is rare and is less painful. Temperature is very high, and the grave symptoms prevent a diagnosis of fracture from being accepted. A large incision must be made deeply through muscles and fascia, down to the surface of the tibia; all pus must be removed and the trephine applied to remove all affected bone. The wound is then disinfected and drained. Osteomyelitis in adolescents is an acute infection having its point of departure in the medulla of the bone, and the treatment may be summed up in three words: trephining, rapidly and widely.

Large Curds in Infants' Stools.—F. B. Talbot (*Bost. Med. and Surg. Jour.*, June 11, 1908) concludes, as the result of analyses of

curds in infant's stools, that the large curds are composed of some proteid (probably casein or one of its derivatives), which on coagulating entangles the milk fat in its meshes. The amount of fat in the curds depends on the amount of fat in the milk, and as this fat increases it replaces the proteid in the curd. The presence of large curds, which has been taken by some investigators to indicate an increase of gastric hydrochloric acid, can with as great probability be interpreted as indicating a lack of this acid.

Infant Feeding.—F. H. Lamb (*Arch. Ped.*, June, 1908) holds that the most important thing in infant feeding is to know the exact amount of food the child receives in twenty-four hours. The only way to do this is to calculate energy quotients. He says that the percentage method is uncertain, complicated and unscientific. One should feed amounts, not percentages. Overfeeding is one of the most common causes of nutritional disturbances in children and is a distinct clinical entity. Fat is the element in cow's milk to be feared. Fat produces constipation, proteids never do. The curds in the stools are not proteid, but calcium soaps, fatty acids or fats. Casein is not difficult to digest, does not produce digestive disturbances and does not undergo putrefaction in the intestinal canal. The newborn infant can digest starch. Dextrins and starches are the most valuable adjuncts to milk feeding. The volume of the food should depend on the weight of the child and never exceed thirty-six to thirty-eight ounces. The interval between feedings should never be less than three hours, and after three months four hours.

Thymic Asthma.—The patient of J. Schwinn (*Jour. Amer. Med. Assn.*, June 20, 1908) was twenty-three days old when operated upon for dyspnea, which had been present since birth and was supposed to be due to parenchymatous goitre, until a radiograph showed the shadow of an enlarged thymus. When an attempt was made to draw the latter up through an incision at the upper border of the sternum, the dyspnea was greatly increased. The manubrium was then split mesially by a vertical incision and the fragments separated. Through this opening all the thymus except a small portion of the left lobe was removed and the enlarged left lobe of the thyroid was resected. The thymus showed simple hypertrophy. Recovery was rapid and uneventful. The writer says that in such cases the operation should be performed as soon as a diagnosis is made, the radiographic method being the most reliable of our diagnostic means. A tracheotomy should be provided for in every case, but avoided, if possible, on account of the danger of infecting the mediastinum. The upper chest aperture should be temporarily enlarged by the splitting of the sternum, if during the operation the dyspnea is increasing at all; in this way it will be possible to avoid tracheotomy in a number of cases.

Cerebrospinal Meningitis.—A. Miller and S. A. Barber (*Jour. Amer. Med. Assn.*, June 13, 1908) report successful results from the use of Flexner's antiserum in an epidemic of cerebrospinal

meningitis occurring in Porterville, Cal. In twelve cases the serum was not used and only one recovered, a mortality of 91.6 per cent. Four were given the serum. Three of these recovered and the fourth was improving when the supply of serum was exhausted and death occurred. The writers agree with Flexner that the serum should be used as early as possible, daily doses of 30 c.c. being injected into the spinal canal, whether the same amount of spinal fluid is obtained or not.

Ocular Tuberculin Reaction.—C. P. Clark (*Jour. Amer. Med. Assn.*, June 20, 1908) tabulates his results from the conjunctival tuberculin test in eighty children, these showing that it presents additional evidence of tuberculosis when present. From a review of 2024 reported cases, including twelve giving very severe reactions—*i.e.*, chemosis, keratitis or corneal ulcer—he concludes that if a 0.5 or 1 per cent. solution is employed, preferably of original old tuberculin, in individuals free from previously diseased eyes, there will be little danger. Hypersusceptibility, if natural, cannot be foretold; acquired hypersusceptibility, by repeated instillation into the eye or subsequent subcutaneous injection of tuberculin, should be avoided where possible, for it has been the experience of many that reactions under such circumstances are very frequently severe. A positive reaction following repeated instillation into the same eye is not of diagnostic worth, but is simply an evidence of acquired hypersusceptibility—an additional reason why second instillations should be abandoned.

Opsonic Index in Infants.—From the examination of the opsonic indices to the tubercle bacillus, staphylococcus, streptococcus, and bacillus coli in infants under one year of age. J. H. Wells (*Practitioner*, May, 1908) concludes that a low opsonic index is not diagnostic in children under one year old. In infants a low opsonic index is not inconsistent with health, and the child may be thriving well with a declining index. Where the opsonic index is low this will rise in response to the stimulus of an inoculation with a bacterial vaccine. The healthy breast-fed infant apparently possesses no advantages over the healthy artificially-fed child. The antibacterial defence in children cannot depend upon the opsonic content of the serum.

Cleft-Palate Operation.—H. M. Sherman (*Surg., Gyn. and Obst.*, June, 1908) advises operating upon the palate as soon as the child is old enough to stand the shock of the operation and the loss of a little blood, and has sufficiently developed tissues to hold sutures and not too small a mouth, if possible, before the eruption of teeth, and surely before the child begins to speak. He sutures the mucoperiosteal flaps with silkworm gut mattress sutures, the uvula with horse hair. He puts a tape, saturated with an iodized wax, around both flaps as a relaxing suture, surrounding the flaps at the point where the hard and soft palates join. The lateral incisions are packed with iodoform gauze. He operates upon the hare-lip about two months before the operation on the palate, and, at the time of the hare-lip operation, cuts the vomer and the palatal process, and breaks the alveolar process at the proper place to permit the pressing of the projecting

intermaxillary bone into alignment, so as to make the curve of the alveolar arch symmetric. After both the hare-lip operation and the operation on the palate, the child is fed by nasal gavage, giving not too much, but just enough. The mouth and the nose are cleansed with salt solution spray after each feeding.

Erythrodermia Desquamativa.—Carl Leiner (*Brit. Jour. Child. Dis.*, June, 1908) describes a form of dermatitis of which he has observed 43 cases, 41 of these being breast-fed children. Of these, 28 were cured and 15 died. The dermatitis, which he names erythrodermia desquamativa, is a universal skin disease, which consists of a slight inflammation of the whole cutis, a desquamation of the epidermis and a seborrhea of the scalp. The illness is at its height at the end of the second or the beginning of the third month of life. The etiology is not clear. Probably the condition is an autotoxic erythema, which occurs in connection with intestinal troubles. The histological changes consist especially in a dilatation of the vessels in the papillary region and a slight augmentation of leukocytes in the same part, and a slight inflammation and edema of the epidermis, and a parakeratosis. This dermatitis is to be carefully distinguished from dermatitis exfoliativa by the absence of swelling, maceration and exfoliation of the epidermis and by its acute course. From the first symptoms until recovery seven to ten days elapse. The writer advises a warm bran bath to remove fat and dirty deposits from folds of the skin and joints. These are then protected with gauze soaked in olive oil and the face and scalp with a mask of vaseline. A daily cleansing and redressing follow. When desquamation ceases zinc oxide ointment dressings are used. In severe cases with intestinal symptoms a strict diet and calomel are employed. When the results are unfavorable, breast-feeding is replaced by rice-water with milk or buttermilk. In the advanced stage of the disease baths are not to be recommended. In such cases the child is covered with oil or an indifferent ointment. If the patient is unable to nurse on account of rhagades and infiltration of the skin of the lips, the spoon or nasal-feeding must be tried.

Numerical Atrophy due to Burns in Childhood.—A. Daniel (*Presse Méd.*, June 20, 1908) describes a form of numerical atrophy of the elements of the body which occurs in children who have been the subjects of even slight burns. This occurs in burns of the superficial as well as deep variety, and follows the well-known rule that traumas or inflammations occurring during childhood cause an arrest of development. There is no loss of function in these cases, the patients being able to accomplish all movements as well as with the sound limb, but the limb is smaller and shorter than the other. The author gives an example in a patient twenty-two years of age, who was burned at the age of three years on the face, and in whom there was facial hemiatrophy. The large bones of the side of the face were small, with diminution in size of the globe of the eye, of the ear, and teeth, and less hair on the face. All the tissues are equally affected, bones, muscles, adipose tissue, skin, etc. The whole limb is affected, not merely the portion that has been burned. There is no paresis or

reaction of degeneration in the muscles, nor any exaggerated electrical excitability. The most plausible and scientific hypothesis to account for this phenomenon is that the smaller number of elements of each kind are due to an arrest of development. The practical consideration that arises from these facts is the necessity of using every possible means, after a burn has healed, of stimulating the tissues by way of the spinal cord so that this atrophy will not take place.

Infantile Hypertrophic Stenosis of Pylorus.—F. E. Bunts (*Surg., Gyn. and Obst.*, June, 1908) records a successful anterior gastroenterostomy for this condition in an infant of four and a half weeks. He presents a compilation of 114 reported cases with a total mortality of 53.5 per cent., contributed by the various operative procedures as follows: divulsion, 27 cases, mortality 51.8 per cent.; gastroenterostomy, 69 cases, mortality 53.6 per cent.; pyloroplasty, 17 cases, mortality 53 per cent.; pylorotomy, 1 case, mortality 100 per cent. The writer says that congenital stenosis and infantile stenosis are of decidedly different clinical significance. Congenital pyloric stenosis would in all cases call for very early operative interference. Infantile pyloric stenosis develops after birth and is often amenable to medical treatment, but in the absence of improvement an early operation offers an excellent prospect of recovery. There does not seem to be, as yet, any positive way to distinguish between the congenital and infantile forms. The earlier the symptoms, the more probable the congenital form. In selected cases pyloroplasty offers results superior to those of gastroenterostomy, and should be the operation of choice. There has been no recent improvement in operative results. The great determining cause of death in practically all cases is delay, and until this obstacle is removed by the medical attendant, little or no improvement on the present statistics can be expected.

Congenital Pyloric Spasm and Hypertrophic Pyloric Stenosis.—Henry Koplik (*Amer. Jour. Med. Sci.*, July, 1908) calls attention to the fact that in cases of hypertrophic pyloric stenosis cessation of vomiting and all distressing symptoms does not constitute a complete recovery; the infant must also increase in weight and develop in a normal manner. The writer mentions a case which in early infancy presented all the symptoms of hypertrophic stenosis of the pylorus and in which the symptoms persisted until the sixth month of life. They then ceased. The infant not only did not gain normally in weight, but developed the most aggravated symptoms of malnutrition. Operation was advised; but was rejected by the parents. To-day the child is a rachitic dwarf, aged two years, weighing twenty-one and three-quarters pounds, with a height of only 61 cm. This condition, fortunately extremely rare, is a direct result of lack of nutrition dependent on the pyloric condition in infancy. Another contingency which is striking in those cases which have recovered without operation. That is, in after childhood there remains an indication of pyloric contracture and spasm, such as gastric pain and then vomiting of the solid particles after taking solid food.

Normal Arterial Tension in the Child.—E. Gaujoux (*Ann. de Méd. et Chir. Inf.*, July 1, 1908) details his observations of the arterial

tension in babies. He finds that it is generally low in the new-born and increases as the child grows older. Puberty marks the increase to a medium tension. In certain purely physiological conditions—menstruation, digestion, physical and mental effort—the arterial tension in each individual subject is modified.

Malarial Infection in Children.—M. Gioseffi (*Riv. di Clin. Ped.*, May, 1908) says that fever and enlargement of the spleen are not so regular in children as in adults, and hence not of so much diagnostic value. So many other conditions than malarial infection produce the same symptoms that the diagnosis is not easy. At the same time there seems to be no rational doubt that children are more subject to malaria than are adults. All children in malarial regions should be carefully examined and treatment should be given as soon as suspicious symptoms occur. According to some authors, there is such a thing as congenital malaria, while others believe that these supposed cases are instances of very early development of the disease.

Epidemic of Cerebrospinal Meningitis.—Piero Abba (*Riv. di Clin. Ped.*, May, 1908) discusses an epidemic of 13 cases of cerebrospinal meningitis occurring in Tuscany. His conclusions are that cerebrospinal meningitis is not a malady that is easily diffusible by direct contagion or indirectly. The meningococcus is the true pathogenic agent of the disease. The pneumococcus may also cause cerebrospinal meningitis, but the symptoms are not as characteristic as those caused by the meningococcus. The symptoms caused by the last named organism may be differentiated from those caused by other organisms. The bacteriological and chemical examinations of the cerebrospinal fluid give important diagnostic data, if not an absolute criterion of diagnosis.

Treatment of Tubercular Gland Infection by Sea Climate and Chloride of Sodium Baths.—Henri Richardière (*Ann. de Méd. et Chir. Inf.*, June 15, 1908) advocates a sojourn at the seaside as the treatment *par excellence* for tubercular gland enlargements. The means to be utilized besides air, sunshine, and climate, are sea baths, local applications of sea-water, etc. There are some cases in which sea baths are not allowable, and others in which the glands that are enlarged are not in a position to allow of prolonged application of sea-water by bathing. Those cases in which there is pulmonary involvement are not suitable for sea bathing. On the other hand, tubercular bronchial and mediastinal glands are not a contraindication to baths. For these cases chloride of sodium baths, taken in the room, and applications of such water by compresses are valuable. They act by increasing the organic exchange within the body and causing active nutrition. They increase the elimination of urea and diminish the total demineralization and the production of uric acid. In children under three years of age, sea baths excite such fear and aversion that they should not be used, but chloride of sodium baths may be given. When there is marked atony manifested by anorexia, fatigue, and anemia they are valuable. It is much easier to measure the time and localize the applications of baths in the room than in the sea. The most useful climate for these patients is one such as is found at

Biarritz, where there is an equable sea air combined with springs containing chloride of sodium in their waters.

Tuberculin Inoculation by von Pirquet's Method in Children under One Year of Age.—Morgenroth (*Munch. Med. Woch.*, June 30, 1908) says that the old method of inoculation with Koch's tuberculin is of little value in the diagnosis of tuberculosis in children under one year of age, because there are so many other slight causes that may cause fever. Vaccination by von Pirquet's method is more practical. It requires no long observation of the child before its use; it has no bad after-effects; and fever does not occur after the inoculation. In the clinic for children at Cologne this test showed 5 per cent. of 200 children under one year to be tuberculous. These children were in the hospital for all sorts of diseases. In four, at autopsy, cavities were found in the lungs. The inoculations were made with the old tuberculin of Koch, and had no bad effects. The test should be made whenever children are found in contact with cases of undoubted tuberculosis. When this test is positive we may consider it positive evidence of tuberculosis in an infant and, as soon as possible, it should be removed from contact with the tuberculous patient. In general, tuberculosis in nursing infants results from inhalation of bacilli.

Collapse After Injection of Diphtheria Antitoxin.—F. W. Thomas, (*Jour. Amer. Med. Assn.*, July 4, 1908) reports a case of sudden collapse following the injection of 4000 units of diphtheria antitoxin into the subscapular region of a boy of fifteen. The symptoms described strongly suggest those caused by injection of air into a vein. Cardiac and respiratory stimulation and several more injections of antitoxin, none of them with unusual sequelæ, resulted in recovery.

F. L. Taylor (*Med. Rec.*, July 4, 1908) also records an instance of collapse after injection of 6000 units of grade 6a, Department of Health antitoxin in an adult. In ten minutes the patient complained of tingling and numbness in the extremities then in the whole body. Pallor, cyanosis, frothy sputum, rapid and feeble pulse were succeeded by coma, involuntary defecation and apparently imminent death. Artificial respiration and injections of strychnine and atropine led to recovery, preceded by diffuse erythema and giant urticaria.

Epidemic Infantile Paralysis.—M. Allen Starr (*Jour. Amer. Med. Assn.*, July 11, 1908) presents a study of the epidemic of about 2000 cases of acute anterior poliomyelitis occurring in New York and vicinity during the summer of 1907, with a mortality of 6 to 7 per cent. The onset of the disease was uniformly accompanied by a brisk febrile movement, temperature rising to 101 to 103 in the first twenty-four hours; sometimes by a slight chill; usually by vomiting, malaise, general sweating, general severe pains in the limbs and in the back, sometimes attended by some rigidity of the spine and even retraction of the head, and excessive sweating. Diarrhea frequently followed on the second day and continued for two or three days. Delirium was a common accompaniment of the fever on the second or third day. The febrile movement lasted from five to nine days in the majority of the cases. It was rarely attended by very high

temperature, and even in the fatal cases temperatures above 104 were the exception. On the third or fourth day of the disease the paralysis was discovered, though it may have developed a little earlier. It usually appeared suddenly and at its maximum extent from the beginning. The picture was, in some cases, that of poliomyelitis of the ordinary recognized type; in other cases, of poliomyelitis with bulbar paralysis; in other cases, of poliomyelitis with polioencephalitis of Wernicke. In a few cases the children were affected by true infantile hemiplegia. In fatal cases death occurred from respiratory paralysis or heart failure. The acute onset usually subsided in the course of a week or ten days and a state of improvement was noticed, beginning at the end of the second to the fourth week. This improvement has continued up to the present time, and, as a rule, such is likely to go on for two years. In many cases a complete recovery has ensued. The frequency of abortive cases was unusual as was the high mortality of about 7 per cent. The writer gives a synopsis of a bacteriological study from the Rockefeller Institute for Medical Research and original abstracts of the accounts of 44 epidemics. From study of those he says that in fatal cases death usually occurs between the fourth and tenth days, generally through involvement of the respiratory muscles. The prognosis is always serious while the disease is advancing or while the paralysis is extending, especially as it extends upward. If a child survives the eighth or tenth day, prognosis for life is favorable. In 25 per cent. of epidemic cases there is complete recovery. In sporadic cases a few muscles usually remain paralyzed. During the early stage of the disease dry cupping of the back, for a short time only, two or three times a day, may relieve the congestion. Ice bags applied to the spine may have the same effect, and sponging with cool water or alcohol may decrease the fever. Acetanilid, antipyrin or phenacetin, with Dover's powder, may be given to relieve pain. Five grains of urotropin may be given every four hours to a child of 8 years during the acute stage. Some give salicylate of soda. After the stage of onset is over and the pain has subsided it is wise so stop medication for two weeks and then begin the use of strychnin, which should be pushed as far as is consistent with safety. The condition of the muscles may be improved by manipulation, massage and friction with oil or cocoa butter, or allowing the child to play daily or twice a day in a warm bath for half an hour or more, or by applications of galvanism, both constant and interrupted. It is especially important from the very beginning to prevent the development of deformities by carefully adjusted braces when the child is out of bed and by properly adjusted pillows and little sand bags to hold the feet in position when the child is in bed.

Nerve Anastomosis in Infantile Paralysis.—Karl Osterhaus (*Med. Rec.*, July 11, 1908) describes a nerve anastomosis performed on a child ten years of age nearly four years after an attack of anterior poliomyelitis, there being slight right talipes equinovarus with the equinus element the more marked, strongly contracted tendo-achillis, no response to faradism over the peroneal nerve. The peronei seemed to be the only muscles paralyzed. An incision was made over

the biceps tendon and the external popliteal nerve was exposed and partially divided between sutures. A longitudinal incision was also made in the nerve extending above and below the transverse incision, thus isolating a small bundle of fibers above and below. A similar procedure was gone through with on the internal popliteal, the dissection being made close to the bifurcation of the sciatic. The central segment of the internal popliteal was then sutured to the peripheral segment of the external popliteal with fine carbolized catgut, an end-to-end anastomosis being made. In the same way the central stump of the external was sutured to the peripheral stump of the internal popliteal, making a crossed transplantation. The tibialis anticus, tendo-achillis, and plantar fascia were divided subcutaneously, and the whole limb was put up in a plaster cast. Six weeks after the operation the cast was removed and an ankle brace with inside upright was substituted. There seemed to be no improvement in the function of the limb at this time, though the position was better. From this time on a strict course of electricity, baking, and massage was persisted in, with the result that at the end of four months the foot could be slightly abducted and dorsally flexed, and there was distinct response to faradic stimulation. Continuation of the treatment enabled the child to walk without the brace and place the foot squarely on the ground, and abduction and dorsal flexion became quite forcible.

Goiters of the Young.—C. H. Mayo (*Southern Med. Jour.*, July, 1908) says that the cretin may have no apparent thyroid, or may have a very large goiter. Operations upon these tumors are indicated to remove a nuisance, and at times it becomes necessary to relieve dyspnea, but operation should not be expected to otherwise improve the condition of cretinism. If the thyroid is enlarged in these cases it is usually of the fetal type; no lumen in the cells, no secretion, and plenty of connective tissue, or, with more cells, less connective tissue, and cystic degeneration of the whole. Excluding infectious and malignant growths he divides goiters into simple or colloid goiter or diffused adenoma, encapsulated adenoma which may undergo partial or complete cystic degeneration, and exophthalmic goiter. Simple enlargement of the gland in girls at puberty is a fairly normal condition and indicates that menstruation is becoming established. It is but rarely that colloid and diffuse adenomatous goiters in the young become so resistant to treatment, or so annoying to pressure symptoms that extirpation or resection of a portion of the gland is necessary, although it may be advisable. At times, however, during this period, an encapsulated adenoma may develop into a rounded tumor occupying some part of the gland. Such tumors are best removed. For the medical treatment of such goiters the writer prefers some form of iodine internally with intermittent external irritation over the gland. Exophthalmic goiter in the young is most serious. It may appear at a very early age, even at the age of five years. The usual age in which hyperthyroidism develops in the young is between sixteen and nineteen years. In such cases some form of medical treatment should be instituted to improve the condition, but if ineffectual, surgical treatment should be undertaken.

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THE PRESIDENT'S ADDRESS.

SOLVING THE PROBLEM OF OBSTETRICS.¹

BY

E. GUSTAV ZINKE, M. D.,

Cincinnati, O.

ANOTHER year and we will celebrate the 100th anniversary of ovariectomy and honor the memory of its father, Ephraim McDowell. The impulse given to surgery by the invention of ovariectomy cannot be overestimated. It marks distinctly the beginning of the formative period of surgery, a period which closed with the introduction of antisepsis by Lister in 1872 and brought us to the present practical era of the art of healing by manual operations.

The inventions, discoveries and improvements in medicine and surgery within the last one hundred years have not only revolutionized the healing art, but brought it to a state of completeness never anticipated by the brightest minds and the deepest thinkers of the past. The student of medical history marvels at the amount of hard work done and the astonishing, almost miraculous results obtained within so short a time. He also marvels why so little was accomplished in the thousands of years that passed before.

It is not intended to recount or pass in review all the epoch-making events in medicine, obstetrics and surgery that have transpired during the last 100 years. You are all familiar with the achievements of McDowell (1809); of the elder Naegele, who (1812) gave us the "Euclid of Obstetrics," the mechanism of labor; of Long, Wells, Morton and Warren, who discovered and

¹ Delivered at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

applied anesthesia (1842-1846); of Semmelweis (1846), who was the first to discover antiseptics, and of Pasteur and Koch (1865-1871), who laid the foundation of it, and of Lister, who introduced it into surgery, 1872; of Samuel D. Gross, who wrote the first book of pathology, 1838; of Virchow, the author of cellular pathology (1856); of Spencer Wells, Keith, the Atlees, Dunlap and Lawson; Tait, the pioneers of abdominal surgery; of Marion Sims, the elder Emmett, Thomas and Munde, the pioneers of gynecology; also of Tyler Smith, J. Y. Simpson and Barnes, of England; of Spiegelberg, Scanzoni, Schroeder, Saenger, of Germany; of Cazeaux and Tarnier, of France; of Hodge, Fordyce Barker, Lusk and Parvin, of America, each of whom contributed to the development of the obstetric art.

The intricacies of embryology, of which little or nothing was known at the beginning of the last century, have been laboriously traced, correctly interpreted and made an almost complete science by Baer, His, Koelliker, Waldeyer, Schultze, Balfour and others. The wonderful results obtained from research work in histology, pathology, physiology and medical chemistry challenge the admiration of the world.

On occasions like this it is well to pause and consider the amount of labor expended on the numerous discoveries, numberless inventions and the valuable improvements made within recent times and ask ourselves, "What remains to be done? Have we realized to the fullest extent the advantages that have accrued to us from the great progress made in medicine and surgery?"

The invention of new means and methods, the discovery of new facts and conditions, are rarely followed by their immediate adoption and application in practice. Not infrequently their introduction and acceptance is preceded by hot and acrimonious discussion and persistent and strenuous opposition. All know the violent and vicious war waged against ovariectomy. The introduction of anesthesia, especially into the practice of obstetrics, was bitterly opposed for many years. Semmelweis, though he showed ample proof and demonstrated beyond a doubt the value of antiseptics, experienced a sad and unmerciful defeat at the hands of his confrères, and one of the greatest of discoveries was consigned to oblivion for twenty-five years. Every new operation of magnitude, more particularly hysterectomy, oophorectomy, salpingectomy, appendectomy, all operations upon the biliary passages and gastrointestinal tract has

been generally accepted only after protracted opposition. The ever-present disposition on the part of the profession to resist the introduction of new discoveries and inventions into the practice of medicine and surgery must not be regarded lightly or wholly condemned. It is the gantlet which every method of treatment proposed should run. Unfortunately, it often occurs that the discovery of valuable facts and new means and methods of treatment based upon them are not appreciated at the time. Sometimes years pass before the advantages of the proposed new means and measures are fully recognized. Sometimes they are doomed to temporary oblivion, only to be rediscovered or reinvented in the future. The rule is, however, that that which possesses merit is sooner or later accepted and finally becomes the property of the profession, and suffering mankind reaps the benefit.

It would be difficult to overstate the blessings bestowed upon humanity by the discovery of anesthesia and of antisepsis and asepsis. Their introduction into the practice of medicine and surgery have wrought vast and beneficial changes in the therapy of every disease and incidental complications, and have, immeasurably, increased the usefulness of the physician and surgeon. This is true to such an extent that it would seem as though there was no longer room for further improvement, especially in the domain of surgery and obstetrics. But to the careful student of the events of the past and to the discerning observer of present conditions, new avenues of thought and action have opened. To him it is clear that, without further new remedies, improved instruments or extended operations, beneficial changes in present practices and customs could be made to the advantage of the afflicted. In no other department of our profession is this more true than in obstetrics.

SOLVING THE PROBLEM OF OBSTETRICS.

Changes in the practice of midwifery within the last fifty years have been marked, and the results obtained, especially since the advent of antisepsis, are by far the most favorable in the history of obstetrics. But of late one fact has become quite apparent: like a specter of bitter reproach it stands forth and may be seen (between lines) in nearly every chapter in our modern text-books on obstetrics; namely, *There has been no improvement in the maternal and fetal mortality and morbidity of midwifery, except in hospital clinics and in maternities, for the last twenty years!* Professor Leopold, in a lecture delivered

December, 1907, made the following statement: "From 300 to 400 women die annually during confinement in Saxony; in Prussia, 4339; and 6000 deaths occurred from puerperal causes in the German Empire in the past year." Leopold is right when he says: "These figures follow immediately the mortality-rate of tuberculosis, and the war against such a mortality should be carried on much more energetically than the war against small-pox and cholera."

The sole object of obstetrics is, and always has been, to solve the problem of the ever-recurring conflict between the mother and the child to be born. Fortunately, a great majority of births are easy, devoid of difficulty, and help is not needed. But in the sum total of child-bearing women, we continuously find labor complications which render a physiological termination of the act of birth difficult or impossible. In every case of eclampsia, placenta previa, oblique or transverse presentation, narrow or contracted pelvis, we witness a conflict unto death between mother and child. Even to this day, especially in private practice, the best the obstetrician can do is to try to save one of the lives thus put in jeopardy. Usually the child is sacrificed to save the more valuable life of the mother. Not infrequently both lives are lost in the attempt to save one.

In the preantiseptic period, Cesarean section and symphysectomy were equivalent to a verdict of death for the mother. Either operation was, therefore, rarely performed, and many, if not most, of the great obstetricians of the past, up to the last quarter of the nineteenth century, never performed these operations.

During the primitive era of midwifery (before the invention of the forceps), when the child could not be born by the unaided efforts of nature, the obstetrician had the choice of two definite operations, namely, version with manual extraction or, when this course was impossible, embryotomy was his last resort. In those days, too, the midwife was the recognized attendant upon the parturient. The physician was called upon only when spontaneous termination of labor seemed impossible and, as he knew but little more of the anatomy and physiology of labor than the midwife, his function was to deliver the patient at all hazards by version and extraction or by perforation of the child. In cases where turning was sufficient, the life of the child was, as a rule, lost; in cases where the disparity between the pelvis and the child's head was too great, embryotomy was the only

recourse. Both methods placed the life of the mother in great danger.

With the invention of the forceps by the Chamberlins (1600-1747) the formative period of midwifery began; it ended when Naegele (1812) published the first full description of the mechanism of labor. The forceps, now much improved, became a blessing in the thousands of cases in which labor was delayed or was complicated by uterine atony, prolapsus funis, hemorrhage, fever, eclampsia and pressure-gangrene of the pelvic soft parts. The forceps solved the problem of saving mother and child, in cases of vertex presentation with sufficiently ample pelvis. Nevertheless, the field of labor complications, which could be overcome only by sacrificing the child, remained still quite large.

With the advent of the forceps in 1747, the date of their first publication by Van der Swam and Peter Rathlaw, a rapid progress in the development of the obstetric art is observed in England, Holland, France, Denmark and Germany, and with the correct interpretation of the phenomena of labor came the demonstration that the most frequent cause of prolonged and difficult labor was a faulty or pathological construction of the mother's bony pelvis.

The clinical features of placenta previa and eclampsia were well understood. Still, the practical therapy of both complications has ever since been the subject of extensive scientific study and of bitter and sometimes very offensive discussion. While the problem of obstetrics, so far as these two complications are concerned, is not yet solved, it is none the less surprising how many obstetricians of to-day adhere to the teachings of the old masters in the treatment of these anomalies, ignoring the fact that the means of assistance have been made more efficient and extensive through the introduction of antisepsis and asepsis.

The most popular therapy of narrow pelvis at the present time, except in some of the maternities and hospital clinics, is the high application of the long forceps, or version and extraction of the child, or the induction of artificial labor at a period when the child is viable, but still small enough to pass through the bony ring of the pelvis. These operations, as well as Cesarean section and symphyseotomy, have come to us from the preantiseptic period. The latter two operations had rarely been attempted upon the living. This was undoubtedly good practice then. But the best and most recent authors of the European continent, especially Pinard, Zweifel, Gigli, Doederlein, Bumm

and Baisch, claim that in the present aseptic and antiseptic period the therapy of narrow pelvis should exclude the prophylactic resort to the high forceps, version and artificial premature labor, because of the high maternal mortality, 10 per cent., and the enormous fetal death-rate, 50 per cent.

It is also maintained and cannot be successfully controverted that this high mortality is the result of early interference in cases of narrow pelvis, a practice prompted and justified by dread of protracted labor and fear of childbed fever, which so often followed in such cases. For the same reason the expectant method of treatment was, until very recently, discarded entirely. The high forceps, prophylactic version and perforation were resorted to early because the obstetrician would take no chances. Thus nature was given no opportunity to show that spontaneous labor was possible in many victims of narrow pelvis.

We must all recognize that since the introduction of antisepsis into midwifery prophylaxis of puerperal fever is established, and that the treatment of narrow pelvis, rigidity of the soft parts, prolapsus funis, placenta previa and eclampsia has been greatly changed. From the moment the fear of puerperal fever ceased to be the obstetrician's nightmare, the necessity of dragging the child through a narrow pelvis with the high forceps, by version and manual extraction at any cost, disappeared. Confidence in nature's forces returned and the results thus far obtained by the expectant method in the management of labor complicated with narrow pelvis, have proved that many patients delivered themselves spontaneously who previously had been delivered with the aid of the high forceps, version, induction of premature labor, craniotomy, aye, even Cesarean section. To this extent the problem of obstetrics is brought nearer solution.

According to Baisch, "the period of compromise operations records in narrow pelvis about 60 per cent. spontaneous births (Chrobak, Gusserow); other obstetricians, like Braun, only 35 per cent." If we are made to understand that in the past from 50 to 60 per cent. of all women with narrow pelvis were delivered by operative interference and that within recent years Saxinger, Pinard, Zweifel and Doederlein (quoted by Baisch) have secured 80 per cent. of spontaneous births with the expectant treatment of narrow pelvis, we can realize the extent and importance of the progress made. But we must also comprehend that such results can be obtained only in hospital clinics

and maternities or in a home where perfect asepsis can be established and where trained assistants and a competent obstetrician are in attendance.

It is the opinion of Baisch, Zweifel, Bumm, Doederlein and a few others that the problem of obstetrics has been solved in an ideal manner in cases of narrow pelvis, and that there remains but a small percentage of cases, 6 to 8 per cent., in which the problem of ending the conflict between mother and child is yet to be solved. These are the higher grades of justo-minor and contracted pelves. But even in these cases the mortality of both mother and child has been greatly reduced by the reestablishment of Cesarean section and symphyseotomy. These two operations, formerly exceedingly dangerous to the mother, have produced within the last eighteen years most excellent results when performed early, by skillful operators, in hospitals and under strict antiseptic precautions.

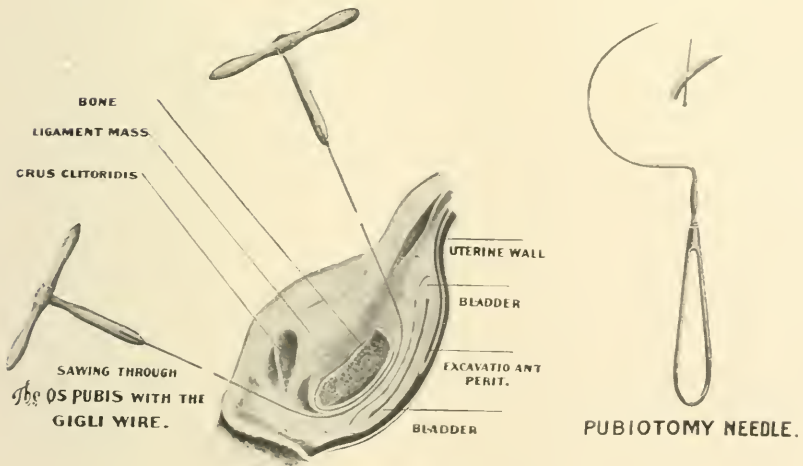
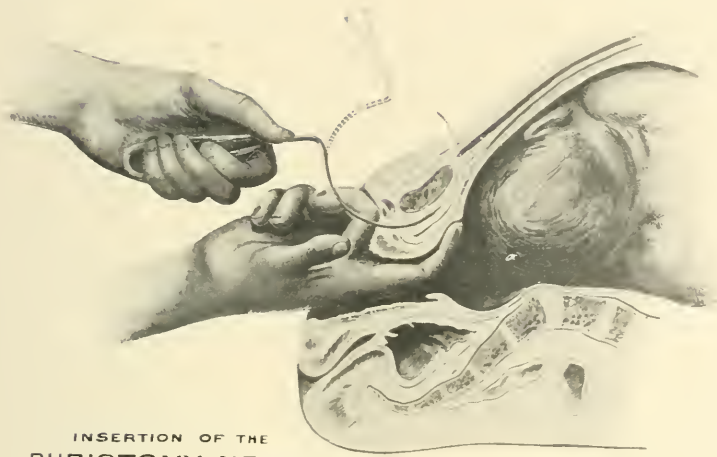
The modern method of performing Cesarean section, as formulated by Pinard, Saenger, Zweifel and Hirst, and the substitution of pubiotomy as devised by Gigli and the subcutaneous hebosteotomy of Doederlein, have given these operations a degree of safety never dreamed of before nor generally appreciated now. Zweifel is credited with 55 Cesarean sections with the loss of only one mother; Schauta with 111 Cesarean sections and but one maternal death. The latter operated 75 times for relative indications and all mothers lived. Hirst has had but one maternal death in his last 36 sections and Davis lost only one of the 43 upon whom he performed abdominal hysterotomy. There are, however, certain dangers of Cesarean section which cannot be eliminated by even the best operators and under the most favorable environment. The dangers consist of infection occurring prior to the operation, of the relatively frequent occurrence of ileus after the operation, the complications that may arise in subsequent pregnancies from the uterine scar and from adhesions, fistula and hernia. These elements of uncertainty leave Cesarean section still within the realm of hazardous procedures, and in the treatment of narrow pelvis it is only relatively indicated.

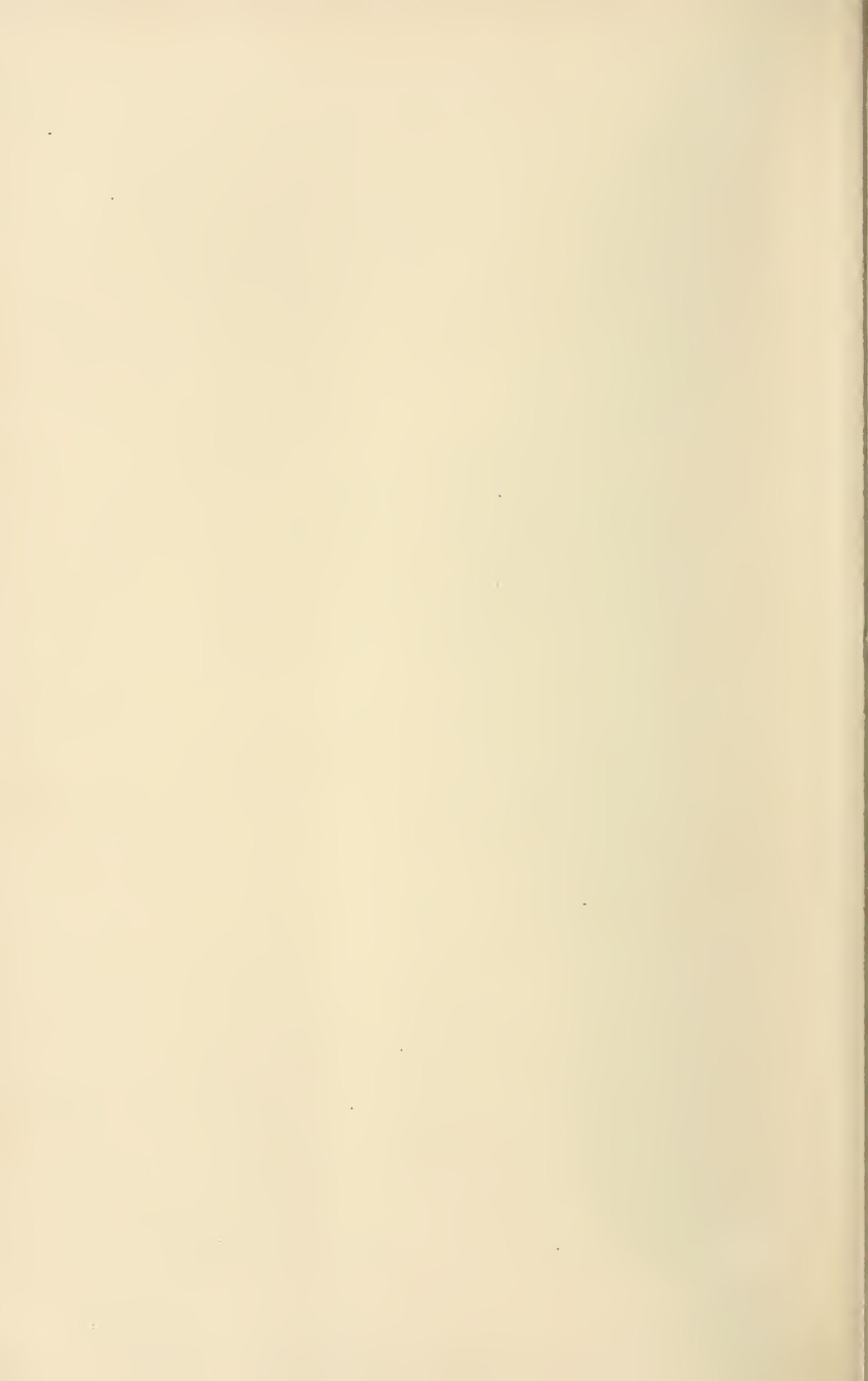
Symphyseotomy within the last twenty years and of late Gigli's pubiotomy and Doederlein's hebosteotomy, when performed in a hospital under aseptic conditions, have been followed by good results. Because of the difficult and laborious after-treatment of symphyseotomy, the occasional occurrence of hemor-

rhage from, and infection of the wound, and the frequent lack of firm union of the joint, the operation did not gain much popularity and led to the invention of the open pubiotomy of Gigli, the partial subcutaneous hebosteotomy of Doederlein and the strictly subcutaneous hebosteotomy of Bumm. The division of the bony ring of the pelvis, whether done in the symphysis pubis or to one side of it, according to the method of Gigli, Doederlein or Bumm, has apparently a very favorable prognosis. Remarkable results have been obtained by it in the hands of Pinard, Zweifel, Kroenig, Bumm and Doederlein who, collectively, record more than 2000 cases of narrow pelvis with a mortality of 0.1 per cent. and a fetal mortality of only 6 per cent.

Though symphyseotomy, Gigli's pubiotomy and Doederlein's hebosteotomy are not regarded with much favor in this country, and are even discouraged and denounced by some of our best and foremost obstetricians, it cannot be denied that the results obtained (especially with Doederlein's subcutaneous hebosteotomy) by the authors just mentioned, are profoundly impressive and worthy of our most serious consideration.

There is a striking contrast between the opinions expressed on this subject at the last German Gynecological Congress at Dresden, 1907, and the last meeting of the American Gynecological Society at Philadelphia, 1908. In Germany, such men as Doederlein, Zweifel, Kannegiesser, Bumm, Hocheisen, Tandler, Seeligman, Henkel, Sellheim, Buerger, Reifferscheid, Thiess, Fritsch, Gauss, Peham, Hammerchlag and other distinguished writers and operators are enthusiastically in favor of the subcutaneous varieties of disjunction of the pelvis in the treatment of moderately contracted and narrow pelvis. Leopold, opposing hebosteotomy, sought to prove that the same good results can be obtained with the compromise operations; but Baisch showed that Leopold made a mistake in his comparisons and that he erred in the calculation of his statistics. Hofmeier favored Cesarean section; Kuestner, artificial premature labor; E. Bauer warns against two great an application of *sectio cæsarea* as well as hebosteotomy. A. Breau (Paris) *thinks* that hebosteotomy is as disagreeable in its consequences as symphyseotomy. As far as the speaker is able to determine, those who oppose hebosteotomy have had no personal experience with the operation. In Italy and France, both symphyseotomy and pubiotomy are generally accepted. In these two countries and in Germany the so-called compromise operations—the induction of premature





labor, prophylactic version, the high forceps and perforation of the living child—are being gradually eliminated from the therapy of narrow pelvis. But in England, in the United States of America and in Canada, the division of the bony ring of the pelvis, whether in the pubic joint or to one side of it, has found little favor and few followers. With the exception of a few of the members, the American Gynecological Society, which discussed this subject, condemned symphyseotomy and pubiotomy in unmeasured terms, notwithstanding that Williams, of Baltimore, performed Doederlein's hebosteotomy thirteen times and was well pleased with the result: that Norris, of Philadelphia, and Fry, of Washington, believed there is a place for both operations, and that DeLee, of Chicago, promised to give Doederlein's hebosteotomy a trial.* Grandin, Jewett, Cragin and Murray, of New York, Hirst, of Philadelphia, and Green of Boston (the latter of whom spoke for all of his colleagues), expressed themselves unqualifiedly against symphyseotomy and pubiotomy under any and all circumstances. They favored the induction of premature labor and, if they did not perform it, would, in "border-line cases" give the patient the benefit of the test of labor" and, if spontaneous labor appeared impossible, resort to high forceps, version and extraction and, if necessary, Cesarean section in preference to symphyseotomy or pubiotomy. At present, all who spoke adversely to these two operations are supported in their opinion by a solid bulwark—the medical profession of this country in general.

There is, however, not the least doubt in my mind that by a strict prophylaxis against infection, the need of the compromise operations can be greatly reduced. In the hospital clinics of continental Europe and in a few instances in this country, these procedures are disappearing from the management of labor complicated with narrow pelvis. Version and manual extraction are always more or less brutal; premature artificial labor is never free from serious danger, and of the high forceps Gusserow long ago aptly said: "They fit the narrow pelvis like the fist of the prizefighter upon his opponent's eye." In spite of antiseptic precautions, the maternal mortality of the high forceps in clean cases remains 4 per cent.; of prophylactic version, 2 per cent.; of premature artificial labor, 5 per cent. The fetal mortality of the high forceps varies from 40 to 50 per cent.; prophylactic

*Dr. E. B. Montgomery, of Quincy, Ill., performed successfully the first pubiotomy in this country (1903) for an impacted head in mento-posterior position.

version, 25 per cent., and the fetal mortality of premature artificial labor does not fall below these figures (Krull and Baisch). J. Kretschmer (Breslau) states that during the years of 1897, 1898, 1899 and 1900, the frequency of operations as well as the fetal and maternal mortality in cases of narrow pelvis was as follows: Frequency of operations, 60 per cent.; fetal mortality, 22.5 per cent.; maternal mortality, 5 per cent. The fetal mortality of the high forceps equals 30.8 per cent.; the fetal mortality of prophylactic version, 33.3 per cent. If, in addition, we consider the damage done to the mother's soft parts, 40 per cent. of cervical and 36 per cent. of perineal lacerations (extensive in character), the dangers of the compromise operations become more apparent.

The latest treatment of narrow pelvis, as now taught and practised in some of the clinics of Germany and France is indeed much more simple, uniform and apparently far less dangerous to both mother and child. It consists of the expectant method (spontaneous labor), of hebosteotomy and (in very rare instances) of Cesarean section. In this country, as already stated, Cesarean section is performed in preference to pubiotomy (hebosteotomy) because the latter operation is regarded as dangerous and unsatisfactory as the symphyseotomy of Gabiatti and Morisani. The speaker unhesitatingly admits that the after-treatment of hebosteotomy demands extra care, but it is not as difficult and laborious as that of symphyseotomy of the past. When we consider that the division of the pelvis does not implicate the peritoneum and the uterus, it certainly is a less dangerous procedure than Cesarean section. Doederlein reports 294 hebosteotomies. In seventy-seven of them the open method (Gigli's) was followed and eight mothers died, 10.4 per cent., in the other 217 cases he pursued his own method and only nine mothers died, 4.1 per cent. Buerger (Vienna) reports 76 per cent. of spontaneous deliveries out of 4,600 labor cases complicated with narrow pelvis. He performed hebosteotomy twenty-one times with uniformly good results for the mother and the loss of two children. Reifferscheid made twenty-seven hebosteotomies with excellent results; one mother died on the fifth day of embolism. Those who have performed hebosteotomy most frequently claim that the danger of hemorrhage and infection is very small, that union of the bone, as a rule, takes place promptly, and when this does not occur, ligamentous union follows which is a positive advantage because it often renders spontaneous labor possible in subsequent pregnan-

cies and does not interfere with locomotion, and the after-care of the patient is not as difficult as is generally believed. Hebosteotomy should not be condemned before a thorough practical trial is made by skilled and experienced men, preferably in hospitals.

If hebosteotomy proves to be what Doederlein, Zweifel, Pinard, Kroenig, Bumm, Baisch and others claim for it, then the difficulty of selecting one of the many compromise operations in a given case will cease to exist, and the mental torture and mortification of the obstetrician when, in the absence of success, the question arises—Was the right thing done?—will belong to the past. This will, indeed, be a great relief to the obstetrician when he considers the indefiniteness with which the indications for the compromise operations have been stated by the writers on obstetrics, no two of whom agree.

In Doederlein's clinic, premature labor, the high forceps and prophylactic version have been discarded and his clinic points with pride to the wonderful results obtained by themselves and Zweifel, Pinard and Kroenig with this new treatment of narrow pelvis. When they do not deliver with the forceps or manual extraction in breech or transverse presentations, they wait for spontaneous labor and, in rare instances, when the disproportion between head and pelvis is not too great, enlarge the bony ring by performing hebosteotomy, or, if need be, perform Cesarean section. They are firm in the belief that the old established treatment of narrow pelvis will become, sooner or later, a thing of the past, and that it is subcutaneous pubiotomy which "gnaws destructively at the foundation of the labyrinthian schoolhouse of indications for the compromise operations." They speak enthusiastically of the marked change in favor of the new therapy of narrow pelvis at the last Gynecological Congress at Dresden, where the magnificent results obtained with Doederlein's hebosteotomy by all operators created a profound impression.

The new therapy of narrow pelvis as suggested by the above authors certainly presents food for serious thought and prolonged reflection. Not so much, perhaps, for physicians who practise obstetrics in hospitals as for the ones who persistently refuse to send labor cases, threatened with complications, to a maternity.

The high forceps, version and extraction, and the induction of premature labor have been and are still favored methods of delivery in cases of narrow pelvis, and in this country especially,

this therapy is carried out unhesitatingly in private practice at the patient's home. This accounts for the high maternal and fetal mortality of labor cases associated with narrow pelvis. There are many reputable practitioners who, in every possible way, decry and discourage hospital deliveries, and the majority of those who do not deny that the parturient could be better taken care of in a hospital, maintain that it is impossible to make hospital deliveries a popular custom. It is impossible to form a correct estimate of the maternal and fetal mortality and morbidity of the treatment of narrow pelvis now in vogue in this country. Abroad, where the records of cases are more strictly kept, the maternal mortality fluctuates between 8 and 10 per cent., the fetal mortality between 30 and 40 per cent. under the old treatment of narrow pelvis.

The results obtained under the new therapy in the thousands of cases of narrow pelvis treated by Doederlein, Zweifel, Pinard and Kroenig, and which show a reduction of the maternal mortality to 0.1 per cent. make a profound, almost startling impression and cannot pass without heed in this country. The waiting for spontaneous labor in the treatment of narrow pelvis is already accepted and practised by many of our obstetricians, but Cesarean section is performed in preference to pubiotomy, and where this is not done, the high forceps, version and extraction, or craniotomy even upon the living child, are still popular procedures when the case has gone to the end of term; or premature labor is resorted to if the case has not advanced that far.

In view of the remarkably good results obtained within recent years by Doederlein's hebosteotomy and the fact that this operation is daily growing in favor with the obstetricians abroad because of its favorable prognosis, it is wrong to reject it solely upon theoretical grounds or for the reason that symphyseotomy or Gigli's pubiotomy were unsatisfactory in our experience in the past. Like Cesarean section, hebosteotomy should be performed, if possible, only in a hospital and by men well trained in the work. For the same reasons we must again express the hope that, before many years, it will be the custom everywhere to send complicated and difficult labor cases, and the parturient who has no proper accommodations at home, to maternity hospitals.

This applies to all cases of prolapsus funis, placenta previa and eclampsia, the therapy of which has also greatly changed since the introduction of antiseptics into midwifery. In these cases,

while the conditions and causes vary in character and origin, the principles of treatment remain the same. In the one variety the obstruction lies in the bony pelvis; in the other in the pelvic soft parts.

The mortality of placenta previa (maternal and, especially, the fetal) remains high. Because of the dangerous condition of the mother the fetal mortality is not generally appreciated by the attendant whose entire attention is occupied with efforts to save the mother. The combined version of Wright and Braxton Hicks; the tampon, followed by version and slow extraction of the child, according to Frey and DeLee; and balloon dilatation (metreuryisis) are the preferred methods of treatment at the present time. Though antiseptics has reduced the maternal mortality in these cases to 8 per cent. the fetal mortality, according to the most recent statistics of Zweifel, is enormous, being 70 per cent. Bossi dilatation has not reduced the mortality of either mother or child and records a marked increase in extensive lacerations of the cervix and perineum. Cesarean section, when performed early, under rigorous aseptic precautions, has been successful for both mother and child in quite a number of cases; but this operation is not indicated in placenta previa except when complicated with narrow pelvis, rigidity of the soft parts, or by transverse or complex presentation of the child.

Dührssen's vaginal Cesarean section will, probably, become the preferred operation when the implantation of the placenta is central, or nearly so, and when associated with an unabridged cervix or rigid os and an ample pelvis. Vaginal hysterotomy, when more generally known and better understood, will displace all compromise operations, including metal and balloon dilatation, indeed, all methods of delivery falling under the head of *accouchment forcé*.

In eclampsia, as in placenta previa, the obstetrician's efforts to save the mother overshadow all considerations for the child. While the speaker is convinced that the physician can do more to avoid this frightful obstetric complication by way of prophylaxis during gestation and, medicinally, when the disease first begins to manifest itself, than by any operative intervention when convulsions prevail, and that the time has not yet arrived when one can say with degree of certainty, that *this* or *that* operation will save the mother, he repeats that he is convinced that, if an operation is to be performed and the indications for Cesarean section are not sufficiently definite, vaginal hysterotomy is the

gentlest, quickest and most promising procedure for both mother and child. All compromise operations, metal and balloon dilatation, and Cesarean section, in the presence of an ample pelvis and child not abnormally developed, cannot be compared for safety to vaginal hysterotomy in case of eclampsia.

Baisch, who is supported in his opinion by Bumm and Kroenig, says of Dührssen's operation: "The rapidity with which the uterus is opened, the opportunity of observing every phase of labor, the certainty and precision with which hemorrhage can be arrested and the wound taken care of, the smooth and easily recognized and readily accessible incision, are advantages which elevate vaginal Cesarean section far above balloon and metal dilatation," and for evident reasons above all compromise operations and even abdominal Cesarean section.

Everything considered, it would appear that the time has come when the expectant spontaneous labor, hebosteotomy and, in very rare instances, Cesarean section will take the place of craniotomy, induction of premature labor, prophylactic version and the high forceps in the treatment of narrow or contracted pelvis. The thousands of cases thus far treated with the new therapy show that spontaneous labor occurs in about 80 per cent. with the mother uninjured and the child living; 15 per cent. being delivered with the aid of hebosteotomy and 5 per cent. by Cesarean section. These magnificent results prove the wisdom of the expectant treatment of narrow pelvis; and hebosteotomy and Dührssens operation, while done in the interest of the child, are strictly scientific, and practical, as well as gentle operations, and are of a life-saving character for the mother. Let us hope that the large number of compromise operations, including balloon and metal dilatation, will be abandoned for the *expectant* or *spontaneous* method and the two complete operations with definite indications—*hebosteotomy* and *Cesarean section*. *Vaginal hysterotomy* will take the place of accouchment forcé, the repeated application of the tampon and of balloon and metal dilatation.

The compromise procedures should be limited entirely to cases in which infection has occurred. The presence of sepsis excludes hebosteotomy and especially Cesarean section from the management of cases. The achievements of recent years find no application in septic cases and the field of usefulness of hebosteotomy, vaginal hysterotomy and Cesarean section should be limited to hospitals entirely if possible.

For years the speaker has ardently and persistently advocated

that pregnant women, victims of conditions indicative of possible labor complications, or whose homes are ill-suited for parturition should be taken to a hospital for delivery. Some good has been accomplished; but the majority of general practitioners of the city, as well as of the country, do not look upon the proposal with favor. Yet the seeds which have been sown would, at an early date, bear abundant fruit, if teachers of obstetrics would advocate hospital deliveries and proclaim the fact that this is the only way in which the mortality and morbidity of midwifery can be further reduced.

Not so many years ago a hard battle was fought against the custom of performing abdominal operations in private houses. The abdominal surgeon who precipitated the fight, was victorious and, as a direct consequence, abdominal surgery developed to an extent not expected by even the best and most hopeful operators in that department of surgery. As then, so now! The problem of midwifery will not be solved until sepsis can be avoided in every case of pregnancy, labor and confinement, and, until all women pregnant, who are threatened with prolonged and difficult labor from any cause, shall be taken to a hospital for the purpose of confinement.

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4 WEST SEVENTH STREET.

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Transactions of the Twenty-first Annual Meeting, held at Baltimore, Md., September 22, 23, and 24, 1908.

The Vice-President, DR. E. GUSTAV ZINKE, of Cincinnati, Ohio, in the Chair.

The Association convened in the assembly hall of the Hotel Belvedere.

Addresses of welcome were delivered by the Mayor of Baltimore, Honorable J. B. MAHOOL, on behalf of the city, and by DR. BRICE W. GOLDSBOROUGH, President of the State Medical Association, in behalf of the profession of Maryland.

The response to these addresses of welcome was made by Dr. JOHN W. KEEFE, Providence, Rhode Island.

After announcements by the chairman of the local committee of arrangements, and the transaction of other routine business, the reading of papers was begun.

ARTERIOSCLEROSIS OF THE UTERUS.¹

BY

CHARLES M. REES, M. D.,
Charleston, S. C.

UNDER the foregoing title I desire to invite attention to a pathological change in the walls of the uterine arteries, which is an etiological factor in profuse uncontrollable hemorrhage

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore September 22-24, 1908

from the uterus of greater clinical importance than has generally been observed. The recital of a case which came under my care together with two others I have been able to collect will, I trust, serve to illustrate the value of the subject under discussion.

CASE I.—Mrs. K., fifty years of age, mother of five children; general health had always been good, her appearance being that of a well-preserved woman of her age. Menstruation was regular and normal in all respects, but ceased abruptly at forty-five years of age. One year after entire absence of menstruation bleeding from the uterus appeared at irregular intervals of three or four months, lasting three or four days, and at times was quite free. For three months previous to her first visit to me, hemorrhages from the uterus had been very free, coming several times during the month, and rarely being entirely absent. She had lost in a few months, and rapidly in flesh and strength, and was much alarmed over her condition.

Examination of her pelvis was made and the uterus found to be movable, slightly enlarged, with a bloody discharge from the os, but without the odor which suggests malignancy. The cervix was rather hard, and no tumor was found in her pelvis. With the clinical evidences so marked at her age, a radical operation was advised, for which her consent was readily given. Examination found her heart and lungs normal, with the radial pulse soft and elastic. Examination of the urine was normal. Operation for hysterectomy was made through the abdomen. When the uterus was grasped it gave the impression of being unusually hard, and the tortuosity and prominence of the uterine arteries and their branches at once attracted attention as most uncommon. When an attempt was made to ligate the arteries I found them so brittle they would not support a ligature, and when an artery was grasped with hemostatic pliers a segment of the vessel would come away in the bite of the forceps. Hemorrhage was enormous and it was with great difficulty that it was only partially controlled, dependence being largely on firm packing with strips of gauze. The operation was prolonged, and the patient left the table anemic to a degree, and in the most profound shock. Intravenous injections with normal salt solution were given; and though every possible expedient to bring about reaction was resorted to, she died within two hours from the beginning of the operation. I regret that this specimen was carelessly misplaced, and that a microscopical examination was not made. However, the macroscopic findings were such as to practically

demonstrate the facts. The uterus was hard, and the blood vessels gave the impression of segments of a chalky tube held together by an outer coating of elastic fiber, so extensively infiltrated were all the arterial coats with calcareous deposits. (This case I reported briefly before the S. C. Medical Association in April, 1907.)

CASE II.—A patient of Dr. Robert S. Cathcart, of Charleston, S. C., is of interest, and Dr. Cathcart has kindly given me all the facts connected with the case. Mrs. B., age forty-four, married at twenty-three years, two children at term; one miscarriage of twins at five months; more or less difficult and painful menstruation, until after the birth of her children, when this function became normal. She was a large generally well-nourished woman. In June, 1907, there was a free hemorrhage from the uterus which lasted a good many days, and could not be controlled by any ordinary measures. She consulted a physician in a neighboring town, who gave as his opinion that there was a cancer of the uterus. This diagnosis was not accepted by the patient's husband who is a physician. The patient was then taken to Dr. Howard A. Kelly, of Baltimore, who made a careful study of her case, and determined that there was no evidence of cancer of the uterus. She was treated by Dr. Kelly, and returned to her home, with the advice—should the hemorrhage reappear, to return to Baltimore prepared to have a radical operation made for the removal of the uterus.

After treatment in Baltimore, though her general health was better, bleeding from the uterus continued irregularly, sometimes at intervals of only seven days, lasting for a couple of days, and again with periods of complete absence for as long as three months. In November, there was a free hemorrhage from the uterus which lasted three weeks. For this a curettement was done, giving temporary relief. In December bleeding reappeared, was free, lasted about a month, and could not be controlled. This continued with intervals of only a day or two of cessation, and resisted every known means of treatment for its control until February 25, 1908, when Dr. Cathcart was called to see the patient at her home about one hundred miles from Charleston. He found her anemic and exhausted from loss of blood. He was able to control the hemorrhage by firmly packing the uterus with strips of gauze, and advised her removal to an infirmary in Charleston.

The patient was prepared two days later for operation. At

the beginning of the operation the uterus was curetted,[†] and a section taken from the cervix. Both specimens were given for immediate microscopical examination to a pathologist who reported in a few minutes that they were not malignant. Her abdomen was then opened for hysterectomy. The uterus was slightly enlarged and firm. The uterine and ovarian arteries were prominent and tortuous. Hysterectomy was completed without difficulty, and the patient made an easy recovery. Sections for microscopical examination of this uterus were taken by Dr. George McF. Mood. He reported no evidence of cancer, but fibrous changes in all the arteries. I have neglected to mention at the beginning of this report that there was no evidence of a general arteriosclerosis.

CASE III.—This closely resembles the one recited above, and need not be repeated here. It has been placed upon record in a very complete and interesting article—"Arteriosclerosis of the Uterus" by Dr. Robert S. Slocum, of Wilmington, N. C. His article appeared in the April, 1908, number of *Surgery, Gynecology and Obstetrics*. In the May, 1907, number of the above journal Dr. T. J. Watkins, of Chicago, exhibited a specimen of arteriosclerosis of the uterus before the Chicago Gynecological Society, and made a brief report of this disease, emphasizing the necessity for hysterectomy, whether or not malignancy is found, on account of the great danger of not getting the right specimen, and of the great probability of the uterus becoming malignant, if it is not already so. Except in one of the volumes of *Operative Gynecology* by Dr. Kelly, where arteriosclerosis is given as one of the causes of hemorrhage, it is not mentioned in any of the text-books devoted to diseases of women, I have had access to.

For the cause of arteriosclerosis I quote briefly from Dr. Osler's *Practice of Medicine*: "Physiological arteriosclerosis depends in the first place upon the quality of arterial tissue (vital rubber) the individual has inherited, and secondarily upon the amount of wear and tear to which he has subjected it. Overwork of the muscles, by increasing the peripheral resistance and by raising the blood-pressure is a potent factor."

When we recall the muscular arrangement of the uterus, and remember the fact that this organ is subjected to the most radical structural changes during the life of a child-bearing woman of any organ in her body, offering at one time resistance to the blood-supply, and again relaxation which admits of easy access of blood, the arteries alternately dilating and contracting,

and with this process more or less frequently repeated, truly a condition is obtained, which is most favorable for the development of a localized physiologic arteriosclerosis. In a fair proportion of cases this physiological change degenerates into a pathological one. The sclerosed arteries become so weak that they are no longer capable of standing the blood-pressure, and give away with hemorrhages from the uterus, which may be sufficient to cause the death of the woman, and certainly to so deplete her that permanent invalidism is produced. Curettement, in arteriosclerosis of the uterus, except for its immediate effect (and this is very temporary), increases the liability to hemorrhage. All preparations of ergot increase the bleeding by raising the arterial tension of the inelastic vessels.

In a paper by Dr. Frank F. Simpson, of Pittsburg, Pa., "Unusual Dilatation of Cornual Bloodvessels," read at the 1905 meeting of this Association in New York, he states that sclerosis (referring to the uterine arteries) in its several forms is found varying from a slight nodular infiltration of the intima to complete obliteration of the vessel. Dr. Simpson has also observed cases of arteriosclerosis where the uterine vessels were accompanied by menorrhagia, and metrorrhagia which began between the ages of 38 and 45 years of age. They grew more and more pronounced, resisting all medical and minor surgical measures, finally endangered life, and yielded only to hysterectomy. In an abstract from *Surgery, Gynecology and Obstetrics*, Sept., 1906, vol. ii, by Dr. Kurt Wittek (Sclerotic Changes in the vessels of the Uterus and the Climacteric Hemorrhage), Cruveillier and Rokitansky are mentioned as the first to report such cases, to which Cruveillier gave the name of *appoplëxis uteri*. Klotz, Wincke, Martin and Vail are spoken of as calling attention to the subject. Scanzoni, in 1859, and later, Corneil, 1889, emphasized the fact that rigid and brittle vessel-walls with a thickening of the uterus from sclerotic arteries was a definite cause of hemorrhage. In the January, 1907, number of *Surgery, Gynecology and Obstetrics*, Dr. Ostrom, of New York, in discussing the propriety of removing the uterus for nonmalignant diseases, refers to arteriosclerosis of the uterus as a rare disease, and one but recently differentiated, that it closely resembles metrorrhagia myopathica, but differs especially in the hypoplastic changes in the mediâ and adventitious coats of the vessels, which reduce their contractile power and favor capillary hemorrhage. He further states it is impossible to say that the pathology will

long be confined to the blood-vessels and with this uncertainty, if the disease cannot be cured by other means of treatment, curettement, and the like, removal of the uterus is justified.

In conclusion I desire to emphasize the following facts:

First, that a diagnosis of arteriosclerosis of the uterus is difficult to make, and can only be made where it is possible to exclude every other cause of hemorrhage from the uterus, and by microscopical examination of scrapings from the uterus, in which sclerosed capillaries are found, or finally from sections of such a uterus after its removal.

Second, arteriosclerosis, as a definite cause of hemorrhage from the uterus, occurring in women between the ages of 40 and 50 and among those who have borne children, is of greater importance than has generally been determined.

Third, that in a fair proportion of cases the hemorrhages from the uterus are in themselves sufficient to endanger the life of a woman, and can be made to yield only to hysterectomy.

Fourth, that, with the uncertainty of diagnosis even after examinations of a section from the cervix and scrapings from the uterus, which show no evidence of malignancy, in women between the ages of 40 and 50 who have borne children, and suffer with frequently recurring hemorrhages, hysterectomy is justified.

89½ WENTWORTH STREET.

DISCUSSION.

DR. C. C. FREDERICK, of Buffalo, New York, said this subject had interested him because it explained some of the cases of persistent bleeding where there was no great enlargement of the uterus, no evidence of any fibroid growth, nor any evidence from the scrapings of any intrauterine or degenerative change indicative of carcinoma or the like. Curettage did not improve these women. There was more or less oozing at all times, and very seldom was there any amelioration of the symptoms by anything that was done. He had seen eight or ten such cases in the last four or five years. The first of these patients on whom he performed hysterectomy, eight or ten years ago, had nearly died from the hemorrhage. In this case there were brittle arteries. It was his custom in hysterectomies, when there was ample room in the vagina, to do them through the vagina.

He operated on this case through the vagina by clamps. Since that time he had operated on eight or ten cases for this condition and had employed the clamp-method through the vagina. When done through the vagina the operation was easier and shorter and there was less shock. So far as he could see, nothing but hysterectomy was suitable for this class of cases.

DR. HUGO O. PANTZER, of Indianapolis, Indiana, said the

localized occurrence of sclerosis of the uterine arteries was first described by Virchow, as quoted in a late edition of Schroeder.

The frequency of this affection was much greater than was commonly accepted, and there was no doubt that many of these cases were operative and had been considered by some as indicative of cancer. These cases, however, did not necessarily lead to a fatal issue.

He recalled the case of a woman who would not submit to operation, but who, after repeated profuse hemorrhages, got entirely well.

Regarding the method of procedure, he invariably preferred the abdominal route. In one instance he tried to clamp one of the uterine arteries six or seven times before he was able to control hemorrhage, and on this account he felt a little hesitancy in using the clamps. He should think in the cases just cited the clamp would have been invariably followed by hemorrhages. At any rate, the removal of the clamp afterward would likely have produced a fresh hemorrhage and a new break.

DR. FREDERICK BLUME, of Pittsburg, Pa., confirmed what Dr. Frederick had said with reference to the removal of the uterus through the vagina. Many years ago arteriosclerosis of the uterus was not as well understood as it was to-day; hence, patients at that time went from France to Germany and from one operator to another, seeking relief. They were curetted by this and that operator without much benefit. He recalled one woman whose uterus had been curetted five or six times by prominent operators in 1880-4 in England. She was operated on by Schroeder, while he was in Berlin, whose assistant informed him that they were unable to find any malignant changes. The uterus was removed, Schroeder doing the Freund operation. The speaker had operated on three cases in the last two years. He had had six or eight cases altogether. In every one that underwent operation he resorted to the vaginal method by clamps. Such an operation could be done in fifteen minutes. About two years ago he operated on a woman, forty years of age, but was unable to find a cancerous condition of the uterus. He did a double operation, namely, curetted the uterus and repaired a lacerated cervix. She was in bed about two weeks. Subsequently there was such a profuse hemorrhage that he was called and removed the uterus. In some of these cases he did not remove the uterus, but cauterized the parts.

DR. JOHN A. LYONS, of Chicago, recalled one case that came under his observation after the patient had been in the hands of competent men. At that time arteriosclerosis of the uterus was not clearly understood. Rather than remove the uterus, which had been recommended by others, as a last resort he tried electricity, and obtained an excellent result. The woman was under observation for a year or more, but there was no recurrence of the hemorrhage. This woman had been previously curetted with benefit. Before resorting to hysterectomy he thought electricity should be tried.

DR. FREDERICK asked how strong a current should be used and for how long a period.

DR. LYONS replied that he had used forty milliampères, and for five to ten minutes at a time.

DR. FREDERICK asked how long treatment was continued.

DR. LYONS replied, his recollection was the patient was free from hemorrhage within a month. He could not say positively, however, that the electricity stopped the hemorrhage. The patient had refused operation, and he thought he would try electricity, which was followed by the result mentioned.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, asked on what the diagnosis of arteriosclerosis of the uterus was based if the uterus was not removed.

DR. LYONS replied that he surmised it was a case of arteriosclerosis of the uterus, but was not sure.

DR. CHARLES GREENE CUMSTON, of Boston, said the subject of arteriosclerosis of the uterus was very interesting. He asked DR. REES if an autopsy was had on the first case.

DR. REES replied that no autopsy was made.

DR. CUMSTON (resuming) said that in a discussion before this Association some years ago the question of uterine hemorrhage came up, and he, at that time, said we occasionally got it in chronic Bright's disease. Inasmuch as there was sclerosis of the kidney, there was no reason why we should not have an arteriosclerotic condition in the uterus. Accordingly, some years ago he wrote a paper entitled "Hemorrhagic Metritis," and in it gave the pathological findings, which were chiefly arteriosclerosis of the small vessels of the uterine parenchyma, and likewise considerable sclerosis of the uterus. He advised and practised at that time vaginal hysterectomy, and the members of the society before whom it was read thought he was too radical. Since then he had encountered several other cases in which the uterus was found somewhat enlarged, movable, with apparently no lesion in the adnexa, and he operated purely for uncontrollable hemorrhage if curetment was insufficient. A diagnosis of arteriosclerosis of the uterus could be made when, after a thorough curetment of the uterus, the endometrium was examined and found normal, as it usually was in these cases, the lesion being confined to the parenchyma itself. If the hemorrhage continued after regeneration of the endometrium, he believed the proper procedure was to perform immediately a vaginal, and not an abdominal, hysterectomy. He was not aware of any case that had ever been reported where the lesions were as marked in the uterine arteries as in the case of Dr. Rees, but it would seem to him that even then, with the pipe-stem uterine artery, with a good pair of clamps one could take a good hold on the broad ligament, and it would be very hard for the vessel to get away from such a grip.

DR. ALBERT GOLDSPOHN, of Chicago, agreed with the essayist that the diagnosis was not easy; consequently there was danger

that one might treat some cases under incorrect diagnosis. Actual cases of arteriosclerosis of the uterus should be treated by hysterectomy, and nothing else.

He rose, however, not to speak particularly in reference to the diagnosis, the pathology or treatment, but simply to say a few words with reference to the technic of hysterectomy. Such cases as these might be likened to many other uteri that were useless, and, as a rule, should be removed by the vagina. Vaginal hysterectomy was going back a little too much. It was only about five years when the pendulum swung the other way, when we were trying to do a goodly number of operations for conservative reconstructive treatment through the vagina. That was a mistake, but it was also a mistake to attack such simple cases through the abdomen. Then came the use of clamps. The ligature was dangerous to meddle with. Some kind of clamp was needed that was speedy and safe; but to the clamp there was a very unfortunate feature connected, namely, the use in connection with it of a lot of gauze, which was not an innocent thing in the peritoneal cavity. As we did not leave such a foreign body when we invaded the peritoneum from above, so for the same reason, we should avoid using such a foreign body in the pelvis. It necessitated the agglutination to each other of healthy knuckles of small intestine which became frequently permanently anchored in an abnormal region. The studies of the late Dr. Nicholas Senn, undertaken many years ago, proved that the small intestine was destined to travel. We might put a ligature on it at one place and in ten days we would find it in an entirely different part of the abdomen. In a number of such cases there would be interference with function; there would be abdominal (vague) pains of which no one knew the origin, and once in a while ileus might be produced which would terminate fatally if relief was not given. It had fallen to his lot in years gone by to have done abdominal section three times for conditions of this kind to relieve obstruction. In one instance it had followed vaginal work done by himself, and in two others the patients had been operated on by other surgeons. This should be avoided. The peritoneum was a peritoneal sac which should be united by sutures in all cases of vaginal hysterectomy, where sepsis or extensive adhesions were not present, where drainage was not needed. This closure of the peritoneum one could not well effect if clamps were used which had to be guarded generally by the introduction of gauze. This difficulty he had solved by the use of the Downes's electric angiotribe or clamp (which had been favored by strong men in abdominal surgery where he thought it was of no particular advantage). One could with it get the clamp effect which had been mentioned, and yet not have to look after a forceps which would do away with considerable inconvenience to the patient, and one could, likewise close the peritoneal cavity.

HYSTERIA AS THE SURGEON SEES IT.¹

BY

AP MORGAN VANCE, M. D.,

Louisville, Ky.

It was my good fortune twenty-eight or twenty nine years ago to spend some time in the Hospital for the Ruptured and Crippled in New York. In the nature of things, many cases of nervous disease came there for treatment, and I had a good opportunity to learn something in this line. Among the neurotics who came to this immense clinic were many hysterics, and the opportunity was afforded me to see and study every variety of the many manifestations of this curious disease.

In all institutions of the kind mentioned above a rivalry in diagnosis exists among the medical staff, and one must be on his guard constantly or be deceived by some catch case. This training has been of the greatest value to me in my private practice, and some of the "biggest hits" I have ever made have been in correct diagnosis and rapid cure of hysterical cases, and it is to relate some of these that I write this short paper.

I have been able to find very little of a practical nature in the literature of the subject. It is only facts, the result of personal experience with the treatment employed, that I propose to give in the relation of the following cases. The cure of these people, whose cases I will relate, was, I think, the result of suggestion, though something must be done, as a rule, to impress the patient with the fact that the doctor is "boss" and of all things if one would succeed he must be sure of his diagnosis. The best method of impressing the patient is the "white-hot iron," best applied along the spine, though hot water douching, fly-blistering, good spanking, sometimes even a good "cussing" will often serve the purpose. By all means gain the cooperation of the friends. Hysterics are all tyrants and will stand more waiting on and attention from those about them than any other class of neurotics. They are absolutely selfish, and oftentimes otherwise perfectly curable cases are never cured because of the foolish indulgence of the family and friends. I will now relate the cases illustrating what I mean by the title of this paper.

CASE I.—Dan H., aged thirteen years. About fifteen years

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

ago I was called to New Albany, Indiana, to see this boy, who from my own knowledge came of a very neurotic family. His eldest brother was killed in early manhood by accident, having given distinct evidence of a neurotic temperament, and his next older brother was the subject of Saint Vitus's dance. This neurotic temperament came from his father's side, his mother being a very phlegmatic woman.

The history obtained was that this boy had been sick for over a year, and in that time there had been in attendance some eight or ten physicians; he had been treated for hip-disease, white swelling of the knee, osteomyelitis of the femur and osteomyelitis of the tibia. I found the boy dressed in a nightgown with a string tied around the waist, no other clothing whatever, lying on his face on the floor reading a book. A glance at the title of the book showed me that it was decidedly beyond his age. Upon making an effort to examine his limb he objected strenuously, and on being asked what was the matter with him he said that he had "electricity" in his leg. I then examined him by force and found the left lower extremity swollen out of all proportion, fully twice the size of its fellow, though the boy weighed about 159 pounds. The circulation seemed to be modified, his limb was blue, and goosefleshy or mottled in appearance. The foot was as much swollen as the rest of the limb, the swelling extending fully up to the buttock.

The whole picture to my mind was that of a neurosis, and I was at once convinced that this boy was a hysteric. I took the mother aside and told her my opinion, asked her if she would cooperate with me in anything I proposed to do, telling her at the same time if she would I felt sure the boy could be cured. She said positively that she would do anything I advised. I then went back into the room and immediately told the boy that I was going to cure him. He laughed and said that "Better doctors than you have tried that," and exhibited the vaingloriousness that these patients in my experience always have, thus further convincing me of the neurotic nature of the trouble. I then wrote a prescription and told the mother she would get with it a large thickly spread fly-blister, that she was to sponge off the boy's back between the hips that night, apply the blister and bandage it on snugly, that in the morning she was to pull it off with a jerk that a large bleb would follow which she was to rip open with scissors and apply a greased cloth, and that Dan would be well. I then remarked that I would be back 48 hours afterward, and if

Dan was not well I would bring an iron that I used to burn such people, and that I was sure after he was burned he would be cured.

I returned 48 hours later and the mother met me at the door with a smile, When I asked how the boy was she replied, "He is all right, he has been at work in the mill since the day after you were here, doctor." I asked her if the swelling had disappeared from the leg and she said, "Yes, entirely."

This boy afterward attended preparatory school, then went to college, and is now professor of Latin and Greek in one of the universities of Indiana. Whenever he would mention, after my first visit, that the "electricity" was coming back in his leg, his mother would say, "Well, we will send for Doctor Vance and he will cure it for you again." This was always effectual in bringing about relief from the symptoms.

CASE II.—H. H., a boy aged ten years. The history obtained was that for ten days he had absolutely refused to walk. Upon thorough examination I could find no real trouble and told the mother that I thought it was a case of hysteria in the male, and in the presence of the boy said I would come back the next morning, that if he was not then up walking about I would burn his back with a white-hot iron which I used in such cases, and I was sure that would relieve him. I went back the next day and found the boy had been up since the afternoon before, that he was perfectly well, and has remained so ever since.

This illustrates the effect of simple suggestion without anything actively being done at all, and in ordinary cases, not of long standing, this is usually effectual.

CASE III.—Miss L. W., a well-developed girl of sixteen years, seen in consultation with Dr. Ouchterlony, of Louisville, who stated that he had a case of aggravated hip-disease which he wished me to see. I obtained the history that some weeks before the girl sustained a slight injury by falling from a tree, though little attention had been paid to it. Later, however, she apparently developed hip-disease in an exaggerated form. When walking about she would come down on the affected limb almost to a sitting posture.

On making an examination I could find none of the signs of any real joint lesion and was convinced that it was a case of hysteria following slight injury, and recommended and immediately applied the actual cautery to her spine. This was about twelve o'clock in the day. That afternoon she was able to walk about

the halls of the infirmary without limping or showing any evidence whatever of the hip-disease that had been supposed present. }

Two years later I was again called to see this girl, and on that occasion she looked as if she was going to give birth to twins! Her abdomen was enormously swollen and she was wearing a "Mother Hubbard." I looked her over and found that she had simply a tremendous distention of the intestines. I examined her back and found a tender spot about opposite the tips of the scapulæ. I applied the cautery again that afternoon, the abdominal swelling was absolutely gone within a few hours and she was able to dress in her usual clothes, including a corset! I have seen this girl a number of times since within the last ten years and she has never had any further hysterical manifestations whatever.

CASE IV.—A German girl, twenty-one years of age, seen at the Saints Mary and Elizabeth Hospital, Louisville. She had a decided lateral curvature and was the subject of hysteroepileptic seizures. I made the diagnosis of hysterical spinal curvature, and as a suggestion applied a special corset which held her up perfectly, and while she was wearing it the curvature was overcome. One day as I went into the ward I found she was having one of these hysteroepileptic seizures. She was lying on the bed with only her heels and head touching it—pseudo-opisthotonos—and a lot of women around sympathizing with her. Without any comment I stepped up to the bed, turned her over and spanked her on the buttocks three or four times. She immediately recovered and has thanked me many times since for having cured her.

I take it that the anger and shame induced by this procedure brought about relaxation and took her mind for the time being off her condition. This girl gave evidence of the selfimportance that the majority of these patients have; that is, the evident feeling that she was a curiosity or an interesting subject to the medical profession, which, as already stated, is a constant element in the mental part of these conditions.

CASE V.—This is a very remarkable example illustrating this functional mental disease. The patient was a beautiful girl, twenty-three years of age, who came from a distant city to visit a relative in Louisville. At his suggestion she consulted me in regard to supposed disease of the left knee. The history was that when thirteen years of age she sustained a slight injury to her left knee for which her doctor applied a plaster-of-Paris dress-

ing. This was worn for a few weeks, and at the suggestion of her physician she had made an apparatus for extension of the lower limb, which reached from above the umbilicus to the foot. She had worn this for over nine years. She came into my office on two crutches and appeared to walk with great difficulty, holding the affected limb in front of her. After considerable trouble, I succeeded in getting her on the operating-table in a sitting posture, when she commenced to unbuckle the apparatus. When it was, with great care, removed by her, I began gently to examine her. She cried out as if it caused her excruciating pain. Inspection of the limb showed it to be atrophied to the last degree, looking very much like an infantile paralytic limb. The foot was in complete equinus and the knee in recurvatum. I then adopted new tactics and began plying her with questions as rapidly as I could, succeeding in momentarily getting her mind off her trouble, during which interval I handled the limb with considerable roughness which elicited no complaint. I made up my mind that there was nothing the matter with the girl organically and told her so. She was a very intelligent girl and my conclusion struck her with such horror that she burst out crying and became very angry. I told her I was sorry, but such was my belief, and that if she would allow me to cut off the brace and would follow my directions I would try to relieve the condition. She was very angry and continued to sob and taxed me with cruelty, general heartlessness and the like. It happened that it was about my luncheon time, and I told her while I was getting my lunch she could remain and talk the matter over with her friends and I would be back in the office in a few minutes. In about half an hour I returned and found her still crying and still angry. I then reiterated my statement that the whole thing was nervous, that if she tried she could walk and assured her that her cousin and myself would prevent her falling or otherwise injuring herself if she would try. She thought for a moment and then said she would make the effort. She carefully slipped off the operating-table, with myself on one side and her cousin on the other, and walked across the room once or twice.

There was immediately a revulsion of feeling, and then and there she became convinced that I was right. Whereupon the mental cure was complete. She allowed me to remove the brace from the shoe, and I directed her to let this limb hang over the end of the sofa while lying down and to place a pillow under the knee while in bed. She went to the country and remained a

month on a visit to her relatives. At the end of that time she was walking perfectly well on the limb. Shortly thereafter she returned to her distant home and has been perfectly well ever since.

CASE VI.—Doctor P., aged twenty-five years, who is now a distinguished specialist in a western city, suffered a slight sprain of the knee. There was no evidence of any organic injury whatever. This case was very similar to the foregoing (No. 5) except of shorter duration. I simply gave him a good round "cussing;" he left his crutches with me, walked off and became perfectly well. This example shows how completely the effect of mind over matter may become even in one educated in matters medical and who should know better.

CASE VII.—A sister of charity, aged twenty-five years, had complete club-foot, talipes equinovarus, due to hysterical contracture. This contracture came on suddenly and was absolutely resistful to manual force. The treatment in this case was simply the application of actual cautery to the spine, and the woman walked perfectly well after the first application. However, it was repeated, as is often done, to make the impression lasting.

CASE VIII.—Miss G., sister of a doctor. This doctor came to me and asked me to go to a town a hundred miles distant to see his sister, that she had been confined to her bed for six months and had worn out the family as well as all the neighbors nursing her, that she thought she was dying and would not get out of bed. I told him I would not go to see her, but if he would bring her to me I would cure her! Several weeks after he first consulted me, he again called and asked me to go to the St. Joseph Infirmary, that his sister was there, having been brought from her home on a cot.

I went to the infirmary and walked into the ward where I found a very comely young woman, rosy cheeks and otherwise looking very well, lying on her back in bed. I remarked, "You do not look sick to me;" her reply was, "But, yes, I am; I cannot do anything." I then asked her to turn over on her face, and she replied that she could not do so. Without any further comment, I took her by the hips and jerked her over on her back, saying to her, "The devil you can't," and immediately told the nurse to remove her from the ward where there were too many old women sympathizers, to take her to a room in the infirmary and I would burn her back from the nape of the neck down. The next day when I called she was up and able to walk about the halls

by holding to the wall, muscular weakness from long confinement making this necessary. In three or four days she was walking about everywhere and has since been well.

CASE IX.—Margaret M., fourteen years of age. I saw her at the St. Joseph Infirmary, in Louisville, with Doctor Clark, of Lexington, Ky. The history I obtained was that a year previously, when the child was thirteen years old, her left leg “drew up.” I found on examination that the thigh was flexed upon the abdomen and the leg upon the thigh, and that with a great amount of force no impression could be made in the matter of extending either. When the trouble was first noticed the girl was placed in an infirmary under the care of Dr. Clark, who endeavored to treat her by isolation. However, this isolation did not amount to much because her room was constantly filled with young men and women attaches of the hospital. Her mother, also a neurotic, would send her all the trashy French novels she could get and write her forty-page letters full of nonsense.

When I was called into the case I said I would take charge of it only on condition that her mother kept away from her entirely. This she failed to do. I worried along for a week, but failed to gain any control of the patient, as the mother was constantly writing her long letters and also sending her reading matter of the character mentioned above. The mother then, upon my strenuous objection to her continuing near the girl, left her entirely alone. Under an anesthetic I easily extended the limb and applied a plaster-of-Paris dressing, which remained on three days. This was done simply as a matter of suggestion. I then, while alone with the girl, started to cut the plaster dressing off. After a section had been made the full length and I was pressing it open in order to remove it, the girl cried, “It is going to draw up; it is going to draw up;” at which I very sternly said, at the same time shaking my fist in her face, “If it does draw up, I will break your d—d little neck.” The limb did not draw up, and the child was cured.

Before returning to her home she confessed to me that every effort of her mind and soul had been directed toward making useless everything I did until I gave her that “cussing.”

CASE X.—This was a very interesting case in the person of a sister of charity. I was called to the Saints Mary and Elizabeth Hospital to see a woman, thirty-five years of age, who gave the history of having had her ovaries removed two years previously,

at which time she came near dying from hemorrhage. She made an extremely slow convalescence and had never recovered sufficiently to get out of bed. I found on examination that she was completely paralyzed and was totally blind. She had been examined by two oculists who told her she had a brain tumor and advised sending for me to see if I could not cut it out!

I recognized the woman as one whom I had seen eight years previously and treated for hysteria by burning her back. When I saw her this time she was lying there absolutely paralyzed and totally blind, being fed by the sisters with a spoon; she could not move either hands or legs and would let one touch her conjunctivæ without any complaint. I made up my mind it was a case of hysteria, and in such instances I always like to have a strong woman around to help me. There was present a "wheel-horse" who I knew would fill the requirements, and she was pressed into service. I directed her to get the patient out of bed every night by force, put her on a commode and run hot water on her back. I instructed that this water should be as hot as she could comfortably bear her hands in. The patient stood this treatment for seven nights, and was cured of blindness, paralysis and everything else!

CASE XI.— A woman fifty years of age, also a sister of charity. At the age of twenty-five she was seen by Dr. Crow, of Louisville, on account of some menstrual disorder. He put her to bed and she had been there practically ever since. During the first six years she left the room occasionally, but for nineteen consecutive years she had never been out of bed! She heard of case No. 10 and, having some of the element of faith, she was brought on a bed from her home forty miles distant to the St. Joseph Infirmary, in Louisville, and I was called to attend her.

I found the patient was quite fleshy and very flabby, with no muscular power. I asked her what was the matter with her, and she replied that every time she got up something "dropped down inside of her!" My diagnosis was chronic hysteria. I told her I would get a "contraption" that would cure her of the symptom of "something dropping down inside." This sensation was always referred to the left side at about the splenic region. I again pressed into service the "wheel-horse," telling her to take a piece of brown domestic and pin it tightly around the patient's upper abdomen and lower chest. I also gave her hypodermically one-thirtieth grain of strychnine after each meal telling her it was a most powerful medicine and would make

her strong! The nurse was directed to stand her on her feet several times every day and require her to take a few steps each time, gradually increasing the distance. At the end of three weeks she was walking around the infirmary, shortly thereafter she went out on the streets, and is now in Memphis, Tenn., on a mission trying to make up the twenty-five years she lost!

CASE XII.—A girl, twelve years of age, was brought to me by the matron of one of the charity institutions in Louisville on account of a crippled hand. Upon examination I found this child's hand in contracture, hyperextended at the wrist and flexed at the fingers, perfectly rigid. The history was that she had been peeling potatoes and got it in this way. I straightened the hand immediately by force and produced the hot iron and let her see it, then told Miss Miller who brought the child to me to bring her back again if the hand later became crooked and I would use the hot iron! I put the heated point near the child's ear that she might feel it was hot and be duly impressed. She was immediately cured and has remained well since.

This report embraces simply a few of the many cases I have seen. There is one class of these patients to which I particularly desire to refer in closing, namely, the so-called phantom tumors. We see them frequently, usually in girls about sixteen years old, and the tumors grow instantaneously; at one time the tumor will be high up in the abdomen, at another low down, simulating pregnancy. The treatment I usually administer in such cases is to slap them quickly, and the shock causes the tumor to disappear. It is often poor policy to do much in the way of examining such patients. We must cure them quickly. The more one makes over them, the greater difficulty will be experienced in getting them under your influence.

To repeat, the greatest difficulty which stands in the way of curing many of these hysterical patients is the sympathizing relatives and friends. Until they can be gotten out of the way, little good can usually be accomplished.

921 FOURTH AVENUE.

DISCUSSION.

DR. HERMAN E. HAYD, of Buffalo, New York, thought the great difficulty in connection with the treatment of these cases was the matter of a correct diagnosis. Unfortunately the pendulum did not swing altogether in favor of the essayist. Every one had seen patients of this class who had been sadly neglected, who had been treated for all kinds of so-called hysterical symptoms, when there was really a pathological condition

at the bottom of it; not only one pathological condition, but various pathological conditions, making the case extremely complex, and, therefore, the reason why so many of these neurasthenic, hysterical and neurotic women were not cured was not because they had not had good surgery, but because they had not had enough good surgery. Reflex irritation was capable of producing any of the symptoms detailed by the essayist. For instance, there might be eye reflexes, ovarian reflexes, a retroverted uterus, a chronic appendicitis, a floating kidney. If these pathological conditions were not relieved the symptoms would continue. It was not fair to say that these were simple cases of hysteria. Many of the cases could be relieved doubtless by such treatment as the essayist had referred to—namely, a strong personality, placing these patients under vigorous and sensible hygiene, getting them to be resourceful, making them take advantage of their resources. In that way their nervous systems were improved.

Early in his professional career he had a case of hysterical aphonia. It was an exceedingly interesting case, and as he had seen the work which the essayist had suggested carried on largely in the Nervous and Paralytic Hospital in London, he was alive to the situation. The patient was a young girl who had not spoken above a whisper for many months. She was brought to him after having been under the care of a very competent practitioner. He intimated to the mother privately what he was going to do so that she would be prepared. He ordered a red-hot poker to be brought to him in the presence of the patient and said that he was going to burn her throat, and just as he approached the girl with the red-hot poker she began to speak and never had any difficulty in the way of hysterical aphonia since.

Such an experience as that was to be contrasted with the one he had last year of a woman, 23 years of age, who was markedly neurasthenic. She had been treated previously by a very competent neurologist for six weeks in a general hospital; she was then put in a sanitarium for another six weeks. In short, the woman was bed-ridden for several months. Neither of those practitioners had thought of instituting a vaginal examination. This was done and the speaker found a marked retroflexion of the uterus. The woman was taken to the German Deaconess's Hospital; he operated on her, doing an Alexander operation as well as dilatation, since which time she had been perfectly well.

He cited this case to show that practitioners might be a little too much enthused over the idea that these conditions were pure neuroses, pure functional conditions, when in reality there was a strong pathological element accompanying them, so that the longer he practised medicine and the more carefully he studied his cases, the fewer cases of functional hysteria he found. These cases showed a definite pathological basis usually.

The difficulty attending the diagnosis was so great that one had to be very careful when he said that this or that was simply a case of hysteria.

DR. CHARLES GREENE CUMSTON, of Boston, said the essayist

had called attention to a fact with which general surgeons were familiar—namely, that the lower limb was a part of the body which was more apt to give rise to hysterical symptoms. He referred to pseudotubercular lesions of the joints. In several cases he had found that the quickest way to make them walk, after they had become convinced that they had hip-joint disease, was merely to mention in their presence that high amputation was the proper thing, and in the cases he recalled they were able to walk in a short time afterward.

Flagellation was excellent treatment in some cases, but this could not be generally practised.

He related the case of a woman who had not been able to walk except with the aid of crutches for several months. She had been seen by a noted orthopedic surgeon who confirmed the diagnosis of hip-joint disease which was made by the family physician. The patient came under his care. A pelvic examination was made under ether. She had not been previously examined under an anesthetic. The hip-joint was found free from disease. Pelvic examination disclosed a large hydrosalpinx on the right side, and after its removal the hip-joint symptoms disappeared. Dr. Cumston related other cases.

DR. JOHN A. LYONS, of Chicago, took issue with Dr. Hayd and defended the position taken by Dr. Vance. In many of these cases of hysteria there was no perceptible pathology, and Christian science would effect a cure in many instances. He had cured many such patients of their ills by suggestion. In two instances he had to anesthetize the patients to show their friends that the women were hysterical.

He recalled the case of a man who fell fourteen feet to the ground. The man was picked up by his friends, taken home, and laid on the kitchen floor. The speaker was called, and when about to examine him the man exclaimed, "Don't touch me! Don't touch me!" He suspected he was seriously injured, but examination disclosed that there was nothing wrong with the man and there had not been since. He had not been able to find any pathology in many of these cases. He urged suggestion or Christian science in treating them.

DR. ROLAND E. SKEEL, of Cleveland, said that not only the welfare of the medical profession itself but its patients depended on recognizing the fact that there were two factors to be remembered in many of these cases. While there might be minor pathology in many instances, this was only recognized by the patient herself or himself by reason of overexcitable and oversensitive nerves. Practitioners forgot that if they undertook to discover minor pathology they would doubtless find it. As there was no such a thing as a perfect human body, even if one hunted for all pathology and dug it out with knives, scissors and hemostats, patients would not be cured except in a limited number of cases. He thought it difficult to separate cases of true hysteria from those which had pathology back of them. Illustrative cases were cited.

COMPARATIVE MERITS OF ABDOMINAL CELIOTOMY
AND COLPOTOMY IN THE TREATMENT OF
INTRAPELVIC ABSCESS.¹

BY

WILLIAM S. SMITH, M.D.,

Baltimore, Md.

THE exigencies and exactions of other lines of effort and the limitations inseparable from service in a comparatively small general hospital have prevented me from indulging an undisguised fondness for gynecologic surgery to an extent which otherwise would have been possible. With this fact uppermost in my mind, I quickly laid against myself the charge of unpardonable temerity when I first thought of presenting an address to this national association of physicians, most of whom have had far more opportunity and far more extended experience than it has been my privilege to enjoy. For about ten years, however, I have labored with such persistence and assiduity as circumstances would permit and, even in that short period of time, I should long since have become convinced of my unqualified unfitness for a self-imposed task if I had not been able to arrive at some useful and practical deductions from personal experience. Moreover, in discussing the subject about which I shall speak, I am sustained by the comforting thought that, no matter what position I may assume or which side of the argument I may espouse, I am supported by the opinions and practices of a long array of distinguished men, the preeminence of whose skill and the maturity of whose judgment can not be questioned.

I find upon referring to my records that most of my hospital operations have been performed upon the so-called uterine appendages, with quite a respectable aggregate number of cases of pyosalpinx included in that category. The list of topics given in the transactions of this association seems to indicate that for several years at least there has been no formal presentation of the subject indicated by the title of my paper. These considerations and a cheerfully acknowledged desire to assist, as best I can, in promoting the success of the meeting here in our city, constitute my reasons for appearing before you at this time.

¹Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

I feel safe in saying that pelvic infection, in its multiform manifestations and results, of which pus production is but one, presents the most common and at the same time the most difficult problem with which gynecologists have to deal. This problem is old enough in some respects to have been coincident with the very birth of surgery, and yet is new enough to interest and inspire the most enthusiastic devotee of modern surgical art. The adjacency of the genital tract to the intestines, the physiological functions of menstruation and parturition and the enormous abuses to which the special organs of the female are subjected furnish such favorable conditions as to make these organs the most frequent site for the introduction of bacteria. Unquestionably, infectious diseases of the female pelvis and especially of the Fallopian tubes and ovaries, produce more suffering and more fatalities than all other gynecologic ailments.

I trust the word "intrapelvic" has not been inaptly chosen. Since the earlier days of Virchow and Sir James Y. Simpson the term "pelvic abscess" has held a unique and peculiar place in surgical nomenclature. Though in its literal significance it is clearly applicable to any pus formation located in the pelvis, it has by common usage and concurrent action been so long and so intimately associated with so-called parametritis and pelvic cellulitis that one hesitates even now to employ it in any other connection. In as recent a publication as the "Diseases of Women," by Sutton and Giles, we find that pelvic abscess is described as a collection of purulent fluid within the folds of the mesometrium. It is scarcely necessary to say that this reference is not made in a censorious or derogatory spirit, for our illustrious predecessors had a most rational basis for the nosology which has met with such universal acceptance. The scanty resources of diagnosis, the absence of opportunities for direct macroscopic and microscopic examination of diseased structures, the prevailing methods of obstetric management and the technic of local medication and instrumentation amply explain, if they do not justify, the opinions held and the doctrines promulgated a few decades ago. Regarding the old-time frequency and causation of parametritis and perimetritis a few quotations should be of interest.

In Hart and Barbour's "Manual of Gynecology," published in 1883, we find the following language: "It is the rare exception to examine a female pelvis without finding some traces of a previous cellulitis or peritonitis. The split cervix, so common

in women who have borne children, is almost always associated with some cellulitis at the base of the broad ligaments." Heinrich Fritsch, in his "Diseases of Women," published about the same time, after referring to the puerperal cases, has this to say: "Similar to lesions during labor is the effect of injuries during minor operations on the cervix, preeminently plastic operations, or the treatment with laminaria or sponge tents. Severe parametritis is repeatedly observed as the sequel of the above-named manipulations. There is hardly any gynecologist who has not experienced accidents of this nature. Especially the treatment with stem pessaries is often followed by disease of the pelvic connective tissue. I have seen several cases of universal peritonitis due to the employment of sponge tents, which ended fatally in five or six days. Such cases have occurred now and then during nearly all gynecological operations previous to the use of antiseptis." The last word in this quotation tells the story, for in recent years the advent of asepsis into surgical and obstetrical practice has brought about a readjustment and realignment of the causal factors of pelvic disease, revolutionized the methods of its treatment and made the older text-books on the subject of little more than historic interest.

The tremendous impetus which has thus been given to operative work of all kinds has furnished the richest opportunities for the study of these diseases, both from a pathologic and a bacteriologic view-point. By the utilization of these opportunities we are now able to describe with an approach to accuracy not alone the various forms and positions assumed by intrapelvic abscess formations, but also the indirect and exciting agencies which lead to their production. The recognition, isolation and study of the tubercle bacillus, the gonococcus, the streptococcus, the staphylococcus, the colon bacillus and others of less importance have definitely fixed the responsibility for most of the pathologic conditions in the female pelvis, while the examination of encapsulated pus *in situ* has enabled us to say that in the vast majority of instances it means pyosalpinx, ovarian abscess or tubo-ovarian abscess, and that in hospital practice at least it is found with comparative infrequency in the cellular tissue or parametrium. I say in hospital practice deliberately, for notwithstanding the incalculable good which has been done in the prevention of puerperal infection and the infrequency with which its evidences are seen in the surgical and gynecologic clinics, it still follows with deplorable regularity in the pathway

of ignorant and uncleanly midwives, quasi obstetricians and professional abortionists. And even those who are most keenly alive to the importance of clean methods and who consistently observe an aseptic obstetrical technic are now and then surprised by its occurrence.

In the earlier years of my practice I have frequently been called upon to treat abscess formations arising under such circumstances and I have done so successfully by simple vaginal incision. Other cases are allowed to go untreated until spontaneous rupture occurs in the direction of least resistance and pregnancy follows upon what seems to have been an absolute cure, thus affording a practical demonstration that true primary parametric abscess does occur without involvement of the uterine tubes. Leaving out of consideration numerous instances of this character in which there is usually a direct invasion of the cellular tissue, the hospital surgeon is likely to become biased by his own observations and to place an exaggerated estimate upon the relative frequency of cases arising by invasion of the Fallopian tubes. For the same reason, I am inclined to think, the influence of the familiar gonococcus in its relation to suppurative changes in the pelvis has been somewhat overstated. For instance, Dr. Prince A. Morrow, of New York, who has shown great interest in this subject, both in its scientific and sociologic aspects, asserts that the gonococcal form of infection is responsible for eighty per cent. of all deaths from the inflammatory diseases peculiar to women, practically all the pus tubes, more than 75 per cent. of the suppurative pelvic inflammations and 50 per cent. of all gynecological operations.

Other conditions in connection with which intrapelvic abscesses are sometimes found are necrotic or suppurating uterine fibroids, infected ovarian dermoid cysts, broad ligament hematomata and appendicitis, where the appendix has been downwardly displaced and occupies a position in the pelvic cavity. Such cases are comparatively rare and represent complications of the main disease with which the operator is chiefly concerned. They cannot for this reason be looked upon as coming within the proper scope of this address.

The treatment of pelvic suppuration during the last quarter of a century has undergone striking and almost kaleidoscopic changes. Beginning with an ultraconservatism which we of the present day find it difficult to condone and which could be appropriately described by the injunction, "Remove nothing,

let Nature do it all," we are to-day confronted with an extreme radicalism which can with equal propriety be expressed by the opposing maxim: "Remove everything, for Nature can do nothing." Curiously enough, this radicalism may under certain conditions be extended to the opposite sex, for Veit, in Germany, has suggested, as a preventive of recurrence in the gonorrhœal cases, the castration of the offending husband.

Three decades ago we were told, to quote a text-book on the subject, that "the occurrence of suppuration is indicated by rigors and should be hastened by hot douches and poultices. Opening a diagnosed abscess is to be advised only when the natural process is hastened thereby or a vital indication is furnished by sloughing." A little later it was timidly suggested that "tapping with Matthieu's aspirator is very good and may be often repeated" and that "when pus is present in large quantity, the treatment varies according to the part at which it points." Then came the practice of unhesitatingly incising and evacuating pelvic abscesses through the vagina, sometimes with prompt and permanent relief of suffering. This was followed by the removal of suppurating appendages through Douglas' culdesac as well as by the abdominal method, the efficacy and propriety of which were boldly challenged by Jacobs, Pean, Segond and others who almost startled the profession by declaring that the uterus was the underlying enemy, that it should be removed by vaginal hysterectomy and that the tubal or ovarian pus sacs need not be disturbed.

Hence, at the present day there is nothing like unanimity of opinion or uniformity of practice in dealing with this important problem. Indeed, it is so many-sided and so complex that it would be preposterous to attempt to establish rigid rules designed to apply to any special method of surgical attack. In this as in every other pelvic abnormality requiring operative intervention, each case has features peculiar to itself, all of which are intelligently weighed in outlining and conducting the proper surgical procedure. Nevertheless, there are certain general principles and well-recognized facts which, if consistently and thoughtfully borne in mind, will assist materially in solving the vexed question.

Among the numerous operations, vaginal and abdominal, which are now practised for the relief of the condition under discussion, abdominal celiotomy and colpotomy are, I think, most easily accomplished by the average surgeon. In selecting

one or the other of these methods, any rational and logical conclusion must have for its foundation the clinical features and physical findings, the peculiarities of the infecting organism, the structural changes produced by it and by the reactionary inflammation to which it gives rise, as well as the various important complications which are constantly encountered. The history of a given case will frequently enable one to select the proper operation.

Reference has already been made to some of the offending bacteria. As a matter of fact, in so far as the ascending infections are concerned, I think we need consider only the gonococcus and the streptococcus. The former, as is well known, almost always travels by direct continuity of mucosal tissue and finds its way into the tubes by extension from the endometrium. Streptococcal infection, on the other hand, generally occurs in consequence of an ill-managed labor or puerperium in connection with an abortion or after unclean instrumentation of the interior of the uterus. Having gained access to that organ, the streptococci invade the pelvis through the medium of the veins and lymphatics and thus reach the parametrium.

The clinical features are also distinctive in most instances. In gonorrheal cases, the symptoms referrible to the pelvis are frequently preceded by a urethritis, the very existence of which is strongly indicative of that disease. The invasion is masked and insidious and several weeks may elapse before attention is directed to the pelvis, and even then there is seldom any evidence of active inflammation. An extremely valuable and characteristic feature of tubal gonorrhea is the occurrence of repeated attacks of localized peritonitis, supposably due to the leakage of purulent material from the abdominal ostium or to the passage of the infection directly through the tubal walls. When the streptococcus is at fault, the attack is traceable, as has been said, to a labor, an abortion or to the local use of instruments. The progress of the infection is rapid, marked by severe rigors, elevated temperature and markedly accelerated pulse. Abdominal pain, distention and tenderness are great. These are the cases also in which the tendency to general peritonitis or septicemia is observed.

The physical findings in the streptococcal cases are not always definite or satisfactory, so that the diagnosis of pus formation may of necessity be inferential. If there be an extraperitoneal abscess, it may be detected by bimanual examination and usually

bulges into the vagina at the lateral fornices or before or behind the cervix. It is often unilateral and is in intimate relationship with the uterus, differing in this respect from the tubal and ovarian masses. It is often impossible to elicit fluctuation. The infiltration of the surrounding structures, however, gives rise to an almost characteristic dense induration by which the presence of pus can with an approach to certainty be determined. Primary parametric pus collections are in the vast majority of instances comparatively short-lived and, as has been said, either empty spontaneously or are evacuated by vaginal section and disappear. They therefore play an unimportant rôle in the familiar chronic intrapelvic suppurations for which the adnexa are so frequently removed.

In the gonococcic cases the physical examination is of great interest and value in determining the choice of a method of operative attack not alone from what it reveals, but also from what it so often fails to show. It must be said that the gross lesions in chronic salpingitis are, in a general way, easily determined by the ordinary palpatory signs. It is equally true that it is often if not usually impossible to determine with exactness the precise nature of these lesions or to differentiate among them. A slight or moderate enlargement of the tube may be a pyosalpinx, a hydrosalpinx, a hematosalpinx or an interstitial salpingitis, and no matter how highly developed the tactile sense or how refined the diagnostic skill, conclusions in such cases must be largely supposititious or inferential. The diseased oviduct is commonly displaced and adherent in the culdesac of Douglas; it may also be found beside the uterus or fixed to the posterior aspect of the broad ligament. Only rarely does it lie in front. The tubal masses are identified by the classical sausage-shaped, pear-shaped and retort-shaped swellings. When oviduct and ovary are bound together by adhesions, as they so often are, they form a tumor irregularly spherical in shape and firm in consistence. The pre-operative findings in many instances are remarkably deceptive. I am sure it is a common experience with us all to observe that a tubal or tubo-ovarian mass, which appears by palpation to be of considerable size, is found upon enucleation to be surprisingly small. Even in the comparatively rare cases in which the tube can be isolated and outlined, it is frequently impossible to elicit fluctuation on account of the small amount of fluid it contains or the thickness of its walls.

The great frequency of tubal tuberculosis and the tendency

of that disease toward the formation of pyosalpinx are among the interesting and important disclosures of recent years. Published reports of pathologic and bacteriologic studies of tubal abscess present widely different results, so that even an approximate estimate of the relative frequency of the tubercular form cannot be given. It is probably true that next to the gonococcus and the streptococcus, the tubercle bacillus plays the most important direct rôle in the etiology of that condition. According to Penrose, it is the infecting organism in 18 per cent. of all cases of inflammatory disease of the adnexa. Barton Cooke Hirst found it responsible for 20 per cent. of a series of similar cases, while Whitridge Williams' estimate was 8 per cent. Unfortunately, the differentiation of tubercular from other forms of tubal disease is usually impossible by any method other than the removal and examination of the affected tissues. Its existence may be assumed in salpingitis occurring in virgins and when tubercle bacilli can be demonstrated in the leucorrhœal discharges. The frequent and unsuccessful efforts at cure by incision and drainage of pus tubes later found to be tubercular in nature would seem sufficient to invest this aspect of the subject with great practical importance, and a great advance will have been made when by some diagnostic refinement the presence of tubercular salpingitis can be foretold and excision rather than incision methods practised for its cure.

I shall content myself with the mere mention of the familiar complications which are directly attributable to nature's reaction against the invading organism; namely, the uterine and ovarian displacements and the adhesions to adjacent structures. Those, however, which are referrible to the appendix cannot be thus dismissed. Within recent years the frequent association of pelvic and appendiceal disease has attracted great attention from gynecologists, many of whom make a routine examination of the appendix in the course of abdominal operations and remove that organ when such a procedure seems indicated. Some go even further and do an appendectomy in every case not merely for purely prophylactic reasons, but because it is not always possible to determine by naked-eye appearances whether the structure is healthy or diseased. The relationship and pathologic interdependence of appendicitis and adnexal inflammation have not been definitely determined, but the coexistence of these conditions is so common as to be of great practical moment. Fowler tells us that Clado's appendiculo-ovarian ligament

furnishes a pathway along which bacteria may migrate from the intestine to the right ovary.

Certain it is that the colon bacillus has been repeatedly demonstrated in ovarian as well as tubal abscesses. In the *AMERICAN JOURNAL OF OBSTETRICS* for July, 1904, Reuben Peterson published an article giving the results of careful clinical and microscopic study of 200 cases of pelvic disease with reference to the condition of the appendix, and announced in his conclusions that nearly 50 per cent. of patients with chronic disease of the tubes and ovaries show accompanying disease of the appendix. He says it is the surgeon's duty in the absence of special contraindications to remove that organ in the course of every gynecologic abdominal operation. In a histologic examination of 120 appendices removed as a coincident part of some other abdominal procedure a normal condition was found by John G. Clark in only twenty-five. J. Clarence Webster has found it advisable to do an appendectomy in about 50 per cent. of the cases in which he has opened the abdomen. During the last two years it has been my habit to examine the appendix at every opportunity and to remove it when visibly and palpably diseased, and I have found this to be the case in about one-third of my cases.

With these affirmative observations, bearing in a general way upon the desirability of abdominal section in intrapelvic pus collections on account of rather common and often unsuspected complications, I am prepared to state more definitely and specifically the reasons for the conclusions to which I have been led and the practices which I have followed. In acute primary parametric abscess the indications are clear and strong for vaginal incision, and the results are usually prompt and permanent, as are the results elsewhere in the body when pus has arisen and is located in connective tissue. In cases of large tubal or ovarian abscess of recent origin and within easy reach of the vaginal finger, colpotomy, as a palliative and temporizing measure, finds a useful application. In those rare instances where the general condition of the patient will not permit prolonged surgical manipulation, there can, of course, be no question as to the propriety of at least a preliminary and preparatory vaginal section. In all the chronic cases, and especially in the tubal and ovarian pus sacs, I am thoroughly convinced of the ineffectiveness of colpotomy and almost invariably practise the more precise, rational and satisfactory method of abdominal celiotomy, unless there is some special contraindication.

This method of approach is, in my opinion, distinctly indicated when the conditions present point to the propriety and practicability of conservative surgery, and when the existence of bilateral pyosalpinx can fairly be assumed and complete excision of the tubes stands as the only hope of absolute and permanent relief. Conservatism has in recent years been a great surgical watchword and inestimable advantage has followed its recognition and adoption as a basic principle. The vaginal celiotomists have by great patience and perseverance in developing an awkward and difficult technic accomplished wonderful results in that direction. The burden of my remarks, however, does not contemplate a comparison of the facility and effectiveness of reparative surgery by the suprapubic and subpubic methods, great as are the advantages of the former. The colpotomists—the vaginal sectionists have not been slow in their appropriation and adaptation of this great argument—they are doing “conservative” work, they are “preserving” the pelvic organs and leaving them *in situ*.

I submit that such work does not deserve to be called “conservatism” in its best and highest sense, and that the leaving of hopelessly crippled and functionally useless organs cannot be justified by that contention. Women with double pyosalpinx do not and cannot become pregnant as a result of any incision and drainage operation and the diseased oviducts cannot be restored to physiological usefulness. If the pyosalpinx be unilateral, as it so often is, how many opportunities are missed for real constructive surgery upon the less affected side? Herein, in my humble judgment, lies the great advantage of abdominal section, affording as it does opportunities for careful examination not alone of the numerous complicating conditions to which reference has been made, but of the less seriously affected side of the pelvic basin, and offering to the touch, to the eye and to the surgical skill and judgment unlimited chances for repair, readjustment and readaptation of displaced and diseased structures and for the exhibition of sound and real conservatism as opposed to that which only bears the name. Numerous cases from my service might be cited in illustration of this proposition and I should like to refer briefly to a few of them.

CASE I.—Mrs. A. was operated upon February 21, 1908, for pyosalpinx. Right tube and ovary were large and adherent to rectum and to the side of the uterus and lying in Douglas' pouch. Left tube and ovary also adherent, but lying more to

the side of the uterus. Mass on the right side had been treated on January 20 by vaginal incision and a small amount of pus escaped. The appendix was found firmly adherent to posterior layer of broad ligament—much elongated, thickened and intensely congested. Uterus retroverted and only slightly movable. Right tube and ovary were entirely removed. Left tube amputated about one inch from the uterine cornu and ovary stitched to the remaining stump with the hope that pregnancy might still occur, patient being but twenty-three years old and without children. Tube was shown to be permeable by a small wire passed into the cavity of the uterus which had of course been curetted. Appendix was removed. This case is interesting as an example of the incompleteness and inefficacy of vaginal incision in cases of tubal abscess. Relief had not been obtained, but how much suffering was due to the persistence of pus in the tube and how much to the position and condition of the appendix could not of course be estimated.

CASE II.—Mrs. M. Operation, March 27, 1908, for pyosalpinx and tubo-ovarian abscess. History pointed to gonorrheal infection, pain and invalidism for about three months, beginning with urethritis and leucorrhœal discharge. Pain on both sides, but chiefly on left side, with menorrhagia, painful defecation and reflex symptoms. Physical examination showed an elastic mass about as large as the average orange behind and to the left of the uterus, easily palpable and with thin walls. On the right was a hard, irregular, nodular mass close up to the side of uterus, but no fluctuation could be elicited. Here was a strong temptation to do a posterior vaginal section, but in the hope that some conservative work could be done on the less seriously affected side, I decided to do a celiotomy. The mass on the left proved to be a tubo-ovarian abscess, which, after separating a few adhesions, was delivered through the incision as easily as if it had been a simple demoid cyst. Right oviduct and ovary were firmly adherent to the side of the uterus and to the rectum. Tube thickened to the size of my forefinger and contained a small amount of cohesive, tough and cheesy material. Double salpingo-oophorectomy was done. The findings in this instance showed the wisdom of the course pursued. The mass on the left was of course intraperitoneal, and both tube and ovary were hopelessly diseased. Their removal was easily accomplished through the abdomen. The right abscess could not be accurately outlined, no fluctuation was perceptible, and satisfactory vaginal

incision would have been extremely difficult and effective drainage impossible.

CASE III.—Miss H. Operation, April 3, 1908. I had operated on this patient in July, 1907, for right pyosalpinx. Pain did not entirely disappear and suffering has recently been great. Operation to-day showed a surprisingly good condition of the uterus and the remaining tube and ovary. Uterus was small, freely movable, and the adnexum apparently healthy, the tube being small, soft and patulous and the ovary smooth, firm and free of any evidence of inflammation and easily movable in all directions. Cecum was brought into incision and a congested and adherent appendix was removed. This should have been done at the former operation.

CASE IV.—Mrs. W. Operation, May 28, 1908. This case presents a number of interesting features. Patient had lately been running a temperature of 102 and 103, with great tenderness and pain, denoting active inflammation. Vaginal examination disclosed a tubo-ovarian mass within easy reach of the finger. This was presumably a pus sac and seemed to present favorable conditions for colpotomy. It was, however, a movable mass and lay some distance from the uterus, so I decided upon an abdominal section. On opening the abdomen, I found that a suspension had already been performed and that there was a round cord at least three inches in length extending from the fundus to the lower angle of the old incision. It had become useless, as the uterus was lying in a retroverted position. Right tube and ovary were adherent, but the adhesions were frail and easily broken and the mass lifted without trouble toward the incision. Tubal walls very thick and contained a few drops of pus, ovary cystic. Left ovary and tube slightly adherent, but otherwise healthy and were left. Appendix large, club-shaped and congested and was also removed. Old suspension ligament cut off and new suspension done. This case was clearly not amenable to cure by colpotomy, although the clinical features and physical signs suggested that procedure.

CASE V.—Mrs. J. Operation, August 3, 1908. Patient had suffered for several months from pelvic pain and had recently run a temperature of 102 with great tenderness upon bimanual examination. She was urged to wait for the subsidence of acute symptoms, but insisted upon being operated on at once. An elastic, fluctuant mass could easily be felt through the posterior fornix in close relation with the uterus. No other masses were

palpable. This was presumably pus and offered a strong temptation for posterior colpotomy. Abdominal celiotomy was done, however, and the conditions found amply justified that procedure. Adhesions were general throughout the pelvis, and an ovarian cyst was jammed down behind the uterus and projected through Douglas' pouch. This cyst was adherent to the rectum, to the uterus and to a pyosalpinx on the opposite side. The right tube also contained pus which was above and beyond the cystic growth, far out of reach of the vaginal finger. The diseased organs were removed without special difficulty, the adhesions breaking easily. A vaginal puncture would have emptied the cyst and left the far more serious tubal pus sacs untouched.

As to the desirability of complete exsection of the tubes for pyosalpinx but little argument should be necessary in the light of the clinical and microscopic study of this condition. There can be but one reason for the retention of the diseased oviduct—the possibility of its being restored to functional activity. That there is no such possibility has been sufficiently shown by many observations incident and subsequent to abdominal operations in cases where spontaneous rupture had taken place or incision and drainage had been practised, supplemented by careful pathologic work. The organs are found in such instances to be represented by a firm, impervious cord or a shriveled, strictured sac, clearly incapable of affording lodgment to an ovum or of permitting its transmission to the uterus. But, aside from these considerations, abundant experience has shown that tubal abscess is not, in fact, amenable to even practical cure by drainage methods, and that, to quote a recent authoritative utterance, "Unlike the ordinary abscess, a pyosalpinx is commonly made up of several loculi and its lining consists of the inflamed and distorted mucous membrane. If in some way the pus is discharged or evacuated, in a short time there is a reaccumulation from the diseased and discharging mucosa which lines the abscess sac or from a loculus which has not been reached."

The numerous so-called reasons given by the advocates of vaginal section are for the most part the adaptation of arguments to an assumption already taken. There are but two of them which I have been able to take seriously—one based upon the unquestioned propriety of permitting in young women the function of menstruation to continue and the other having for its foundation the slightly increased immediate danger of radical abdominal surgery. If it were true that the abdominal celiotomy

mist is in the habit of removing both ovaries and both tubes as a routine practice, the former contention would be a good one. But it is not true. On the contrary, there are comparatively few cases of intrapelvic suppuration in which an ovary or at least sufficient ovarian tissue to assure the continuance of menstruation cannot be saved. As to the mortality, I am willing to concede that in any long series of cases the immediate mortality of abdominal section will exceed that of colpotomy, but the latter operation is not without its own inherent dangers. Our colpotomy friends are accustomed to growing voluble and enthusiastic when they descant upon the "harmlessness" of their favorite method. Some of them, however, are ingenuous enough to say, although in implied parenthesis, that "now and then" a knuckle of intestine may be punctured, a dermoid cyst incised or a pregnant tube laid bare. These "accidents," it seems, occur even at the hands of experts and should not militate against an operation upon which above all things the stamp of "ease and safety" has been placed.

If we consider the improvements which have been made in surgical technic, together with the striking results obtained in pus cases by the Fowler postural treatment and the Murphy irrigation, the mortality plea loses much of its significance and force. Recent experience of my own in this connection has been peculiarly instructive and satisfactory. In the last one hundred and ten laparotomies which I have done there has been no mortality. Of this number, fifty-three were performed for intrapelvic pus. Drainage was indicated and used in ten instances and the Fowler-Murphy treatment was twice resorted to. During the same period of time there have been but ten colpotomies, and two of these were followed up by the abdominal operation.

In concluding my remarks, I am pleased to quote from the statements of a few of the Fellows of this association, whose excellent judgment and large experience make their opinions particularly valuable. J. J. Gurney Williams.—"What ultimately becomes of many cases upon whom vaginal incision has been practised? Twenty-five per cent. is about the correct number who return for a subsequent abdominal section and many others go elsewhere to be relieved of their suffering." Joseph Price.—"I have never known a patient to be cured by vaginal puncture or incision." Herman E. Hayd.—"The advocates of the vaginal method presuppose a diagnostic ability which

we all know they do not possess. In every case on which I have operated through the vagina and drained an appreciable amount of pus a later abdominal section was necessary for the relief of suffering and chronic invalidism."

There is another statement on this subject which I am particularly glad to call to my support. Indeed, a paper such as this, would, for a Baltimorean, be almost inexcusably incomplete if it did not take cognizance of the opinions and utterances of one who has done so much for the advancement of gynecology, both in its artistic and scientific aspects, and whose personality and work have made so marked an impress upon the profession of this State and city. I shall therefore close by quoting from "Medical Gynecology," by Howard A. Kelly. In considering the surgical treatment of pelvic inflammatory disease, he has this to say: "It is useless to run risks of a continuance of the trouble from which the patient is suffering for the sake of preserving the menstrual function, if she is forty years old or more. If the patient is single and middle-aged, without any expectation of marriage, the exercise of conservatism is less important. If the patient has to labor for her own living, it is best not to take too many chances of a return of the disease by leaving any crippled structures. It is dangerous to save tubes containing purulent or milky fluid. If the patient wants above all things to be well, then the physician will be less inclined to take chances with conservatism. As a rule, the results of conservatism are disappointing, and the patient ought always to be forewarned that it may be necessary to repeat the operation or to make it more radical if the first conservative effort proves a failure."

330 NORTH CHARLES STREET.

DISCUSSION.

DR. CHARLES L. BONIFIELD, of Cincinnati, Ohio, agreed for the most part, with what the essayist had said. Vaginal incision was of great importance in selected cases. The earlier we could get at pus behind the uterus and drain it, the less severe would be the damage to the uterine appendages, and the more hope there would be of curing these patients without a radical operation. Unfortunately, even under the most favorable circumstances it was the exception rather than the rule to cure by this simple procedure. On the other hand, it seemed to him that to attempt to deal with them by the vaginal route if the temperature became normal, if the patient was in a condition to withstand a radical operation, was attacking the disease in a very awkward and inefficient manner. The mortality from operations

for pus in the pelvis depended very greatly on when the operation was done. The profession was greatly indebted to Werder and Simpson for having called attention to that point, although a great many recognized this principle before they brought it to the attention of the occasional operator—that it was not safe, if it could be avoided, to do abdominal section for the removal of suppurating appendages while the patient was running a temperature.

The question of conservative surgery of the appendages was one that always elicited a good deal of discussion. Some years ago Dr. Frederick read a paper on this subject, or took part in a discussion before this Association in Chicago, and he (Dr. Bonifield) at that time said conservatism depended largely in his practice on the pocket-book of the patient, and Dr. Frederick remarked that "my poorest patients should have my best skill as well as my rich ones." I said the rich patient could afford to go to a hospital frequently, if necessary; that it was worth her while to be laid up for the purpose of having two or three operations, if needed, in order that the menstrual function might be restored and the woman given a chance to become a mother. On the other hand, the woman who could not employ a servant, or who had to earn her own living, could not afford to go to a hospital for a month or two or longer, and in this class he had almost completely abandoned conservative surgery in cases of inflammatory disease of the appendages. Conservative surgery in his experience in these cases was only successful in a limited number of instances. Conservative surgery as regards the tubes was very much more frequently a success than that applied to the ovaries. In those cases in which in years gone by he had removed part of an ovary or had evacuated cysts and left an ovary, in a large proportion of them it was found necessary on their return to reopen the abdomen and he had found the remnant of ovary only a cyst. His experience in leaving part of an ovary had been unsatisfactory, and it was the rarest occasion now that he resorted to that method of treatment.

As to whether the other tube should be removed when one was diseased, he would not remove any organ when it did not give evidence of disease, the appendix or anything else, and the question as to whether the other tube was going to become diseased depended not so much on the condition as on what was done to cure the endometritis. If the other tube became diseased from gonorrhœal inflammation, then the gonorrhœal endometritis was not cured, or the patient had become reinfected.

DR. ALBERT GOLDSPOHN, of Chicago, said that vaginal drainage was a good procedure as such, and was permissible in acute conditions, when there was elevation of temperature, and the like. What conditions were most benefited by such vaginal drainage was the next question, and there came in the matter of classification. The patient furnished a good guide—namely, was the pus located in the pelvic cellular tissue, or inside of the

tube or ovary, or was it intrapelvic? The foci of pus amenable to vaginal drainage were those in the pelvic cellular tissue—parametritis, and they originated in conditions of pregnancy and infection during labor, during abortion, or through some violent instrumental interference. Occasionally women attempted to induce an abortion themselves and had forced an instrument through the cervix into the broad ligament. Where the primary focus of inflammation was not intraperitoneal, nor intratubal, but in the pelvic cellular tissue, or when the focus of inflammation was in the tube, then it became intrapelvic, and these patients were not very much benefited by vaginal drainage, or exceptionally so only. Vaginal drainage came in in cases of pelvic abscesses in conjunction with labors or miscarriages, and once in a while, in opening up some case of double pyosalpinx or ovarian abscess, by means of the finger and forceps one could empty the pus and explore the interior by the finger introduced through the posterior culdesac. Drainage here would accomplish very much. One great trouble with reference to vaginal drainage had been that the technic was not right. Incision was absolutely necessary, and the author was in the habit of making it with the Paquelin cautery which stopped the hemorrhage from the small vessels. A Paquelin cautery incision of two inches in a transverse direction would give access so as to be able to introduce the finger to puncture the abscesses and to empty the pus, then packing, not irrigating. The cavity should be packed solidly, so that the gauze will act as a foreign body which was allowed to remain a week to constitute not simply a drain, but a foreign body to excite the formation of granulation tissue; then at the end of a week this packing being in there as a solid mass was walled off by nature's efforts, making a safe wall against the peritoneal cavity. When this packing was removed, there was a cavity remaining which did not collapse at once. Exceptionally it was washed out and the cavity repacked less solidly, and in that manner one could thoroughly obliterate eventually pelvic abscesses and once in a while a pyosalpinx or an ovarian abscess. With him very few cases required abdominal section later when so treated, and he had been careful not to do this in cases that did not have such abscesses.

DR. C. C. FREDERICK, of Buffalo, in speaking of the relative merits of the abdominal and vaginal route, recalled the case of a woman who had been running a temperature of 101 to 102 for a considerable time. The woman was septic and he believed would have died if he had opened her abdomen and had attempted to do a radical operation. She had been operated on through the pelvis six or seven months previously and had received drainage of the culdesac. She did not improve after this operation very much, and then a physician opened up the incision, introduced a tube, and stuffed it with gauze. She was very little better from this procedure. He slit the incision wide open so as to be able to introduce two or three fingers and discovered an ovarian abscess on the left side out of which

one or two cups of stinking pus was drained. Good drainage was established, and finally in a further search he encountered another abscess which was evidently between some peritoneal adhesions. The cavity was packed full of gauze and within 72 hours thereafter the temperature dropped to normal and the woman began to convalesce. The vaginal route was indicated in certain cases, but in most the abdominal route should be selected in order to do thorough work and completely eradicate the disease.

DR. FREDERICK BLUME, of Pittsburg, said, in speaking of vaginal hysterectomy *versus* abdominal section, that some eight years ago he read a paper before this Association, in which he reported thirty cases that had been operated on by him through the vagina, with very good results, and said at that time that vaginal hysterectomy was one of the favorite methods of attacking cases of pelvic peritonitis. Previous to vaginal hysterectomy having been undertaken, operations were done through the abdomen, and the mortality, according to different operators at that time, varied from ten to twenty-five per cent. If one wanted to go back over the literature, he would find this a matter of record. With reference to vaginal hysterectomy, the mortality was reduced very materially, and a good many cases were operated on by that method, because he had found it difficult to have patients with an acute attack feel well in the hospital who had been kept there for six weeks. About eight years ago, at the International Congress of Gynecologists and Obstetricians, held in Europe, one of the Berlin surgeons pointed out that his experience was that no acute case should be operated on through the abdomen, although he knew he was encountering opposition among those present by taking such a stand. Since then, surgeons had been invariably resorting to vaginal incision and drainage. The speaker believed in vaginal incision and drainage, and then, if necessary, an abdominal operation could be done later.

DR. JOSEPH A. HALL, of Cincinnati, referred to pelvic inflammation resulting from tuberculosis. There was no doubt as to the importance of the leukocyte count. Leukocytosis ran high in cases of appendicitis, and why should it not run high in tuberculosis in the same way? Many pelvic abscesses were the result of tuberculosis, more than the average practitioner imagined. A great number of pelvic abscesses were caused by the gonococcus. Every one realized that vaginal section and drainage, so-called, was undertaken for the relief of pus and symptoms, and where the temperature of the patient was running to 102-3-4,° there was only one thing to do, and that was to get rid of the pus as quickly as possible, with as little surgery as possible, and in a short time open the abdomen and do a more radical operation.

DR. FRANCIS REDER, of St. Louis, Missouri, would like to hear more said about the sequelæ following the vaginal operation. He cited one case in which there was a mistake in diagnosis.

The patient was 19 years of age. During the last two weeks the attending physician informed him that a tumor reaching to the umbilicus was plainly palpable.

Although a diagnosis of pregnancy was made, he thought the patient had a cyst. He opened the abdomen in order to remove the cyst and found he had to deal with an abscess which was located in the right tube. He endeavored to enucleate the abscess, but this was found impossible on account of the condition of the patient and he had to have recourse to normal salt solution. After this he made a vaginal opening and tamponed. The woman's progress was satisfactory, but at present she had an ugly sinus. She was up and about, but her condition was anything but promising. He asked when should he again open the abdomen to relieve the condition that was causing the suppuration?

DR. LOUIS FRANK, of Louisville, said there could be no question as to the advisability of vaginal incision and drainage in acute pus collections as a temporary expedient. However, his experience had been that this procedure in some cases was not highly satisfactory, and that abdominal section had to be resorted to. He recalled one instance in which there was a pus collection between the bladder and uterus, where the fever continued acutely high after vaginal colpotomy.

He called attention to that class of cases, operative in character, in which there were abscesses, as pointed out by Dr. Goldspohn, where there might be infection of the tube and broad ligament, which did not subside after opening the abscesses. He had met with such cases, as he was sure other members had, which yielded only to extirpation of the tube and the removal of the broad ligament. He did not think sufficient stress had been laid on the point brought out by Dr. Bonifield as to resection of the entire length of the tube in operations done through the abdomen where it was desirable to conserve the uterus. Great emphasis should be laid on this, and failure to do so was responsible for many of the secondary operations in so-called conservative work. True conservatism consisted in removing absolutely all of these diseased structures. No one could lay down any hard and fast rule as to what tissue to conserve, as it was largely a question of personal experience, and in his own practice, where he had undertaken or attempted conservatism, he had met with disappointment. He believed with Dr. Bonifield that the truest conservatism consisted in removing the disease absolutely. It was far better to do this than to subject the woman to future danger by undertaking the possible chance of saving a portion of a tube or portion of an ovary.

DR. JOSEPH H. BRANHAM, of Baltimore, thought pelvic inflammation was very much like inflammation in other parts of the body. The cause of the inflammation was some form of germ, but practitioners seemed to forget that the degree of virulence of the infective agent varied so much that it could hardly be estimated; that the infection in one case would be with a germ of

very slight virulence, and then the same germ under different circumstances or in different cases showed the very greatest difference in the amount of virulence. When a patient had inflammation of the pelvis, the object of treatment was to cure her without mutilation. Every one would agree to that. How were we to get at it? The practitioner was certain that there was infection of the tube; the patient might have gonorrhœa, and as a result a tender and sore tube or tubes. Such a patient, if put to bed and given rest and her phagocytes made strong, might get well afterward. He had seen such patients have children afterward. When the case grew worse and the infection severe, with indications of localized pus in considerable quantities, he would open the culdesac and put in a drain. This should be done early. If such patients were treated in this wise early, they would get well, no matter what the form of infection was, unless the mucous membrane of the tube had been destroyed. Opening the culdesac and establishing drainage at an early date was one of the best conservative operations the gynecologist could do, in his opinion. If the inflammatory condition had gone on to the stage where the infective agent or agents in the tubes or in the pelvis had ceased to be virulent, where the germs in many instances had become sterile, the patient's condition being a chronic inflammatory one, where adhesions and other things made operation necessary, then the abdominal route, with the removal of the diseased organs, was the best course to adopt. But he thought early drainage in pelvic abscess, no matter what the cause was, would save a great many tubes by allowing the pus to escape.

DR. SMITH, in closing the discussion, endorsed in the main the position taken by the older and more experienced members of the profession. It was pleasant to have one's opinions backed up by such distinguished gentlemen.

He was pleased with the position taken by Dr. Bonifield in regard to the removal of both tubes where only one was diseased. He had been taught that in gonorrhœal cases, or where a woman had had gonorrhœal infection, even though only one tube was found to contain pus, the other tube should be removed. This teaching had been promulgated quite extensively, but he had not been convinced of the importance of removing a healthy tube in these cases, even though there was gonorrhœa. He thought thorough curettement of the uterus and a careful exsection of the diseased tube would result in a permanent cure, and that there was seldom any necessity for taking out a healthy Fallopian tube, even in gonorrhœal cases.

DR. H. S. CROSSEN, of St. Louis, Missouri, read a paper with this title.

A SIMPLE, CERTAIN AND UNIVERSALLY APPLICABLE METHOD
OF PREVENTING THE SERIOUS ACCIDENT OF LEAVING A
SPONGE IN THE ABDOMEN.*

*Will appear in a subsequent number of this Journal.

DISCUSSION.

DR. HERMAN E. HAYD, of Buffalo, could not see, from what the essayist had said, the importance of adopting this method of preventing very serious accidents in the shape of leaving sponges and foreign bodies in the abdominal cavity after operations. The older he grew, the more he had endeavored to simplify his work. He had endeavored to use as few instruments as possible and as little gauze or sponges as possible, and by this means he was enabled to do his work with greater despatch and necessarily with a very much smaller mortality. The method appealed to him as clumsy, and somewhat dangerous, in that it was necessary to draw the ten yards of cotton out of the wound and, at the same time, having the other end dangling on the floor or in the vessel, touching the operating table or the gown of the operator, and everything else possibly about the operative field. Furthermore, the method might be useful in large hospitals, but in smaller institutions, where the question of expense entered largely into the running of them, the matter of cost was an important factor.

DR. JOHN W. KEEFE, of Providence, Rhode Island, mentioned a method that appeared to him quite simple and which he had adopted for the last few years, and this was a roll or sheet of rubber similar to what dentists call the rubber dam. This sheet of rubber was about nine inches wide and twelve or fourteen feet long. It could be sterilized by boiling, and later on, on account of the powder that sometimes adhered to the rubber, he had it washed with normal salt solution. One could place it on a sterilized sheet on the abdomen and gradually introduce it into the abdominal cavity, thus walling off the intestines. He had used this in gall-bladder surgery and in the surgery of the pelvis. When a portion of gauze was in contact with the peritoneum for any length of time, we were certain to get more or less peritonitis as a result of the adhesions that formed, due to the gauze being in contact with the peritoneum during the operation. As rubber was absolutely smooth and moist, it would not adhere to the intestines. He had used this for fully two years, and had found it very satisfactory. It would not stop hemorrhage, and if there was bleeding it might be necessary to resort to sponging; but when the sponge or sponges were taken out, he left nothing in the abdominal cavity but the roll or sheet of rubber.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, thought that if this method could be used in gall-bladder or intestinal work it would be an advantage.

DR. CHARLES L. BONIFIELD, of Cincinnati, seconded what Dr. Hayd had said with reference to operations, saying that simplicity was the price of success, and he thought that the method detailed by Dr. Crossen was too cumbersome. In abdominal operations too much attention was paid to one feature while others were ignored. Few surgeons would be satisfied with having the end of gauze contaminated with pus, or the contents of an abscess, by hanging down on the floor, with the other end attached close

to the incision. If there were no other way by which one could be reasonably sure of not leaving a sponge in the abdominal cavity, the method of the essayist might be adopted. But there were other ways which were comparatively safe.

DR. FRANCIS REDER, of St. Louis, said he saw the essayist use this method and it rather appealed to him, and he presumed that if the members present could see Dr. Crossen work with this method, it would appeal to them more than the inference they could draw from the reading of the paper. He did not think a nervous or irritable operator would content himself by using this method of sponging, as the mere idea of having something dangling would make him nervous because he would want to have the operative field clear. This was very essential to do surgical work successfully. So far as the use of gauze was concerned, it was only to be used for sponging lightly. It was never to be allowed to remain for any length of time. When the surgeon was through sponging the gauze should be withdrawn.

DR. JOHN A. LYONS, of Chicago, substantiated the remarks of Dr. Hayd with regard to simplicity, and said in a large hospital experience he had noticed that simplicity was what surgeons were striving for. He recalled one case in which a house surgeon left a piece of gauze in a case of pyosalpinx. The end of the gauze in some way got under the abdominal wall and was left there. After the patient had left the hospital a month or so, he was very much annoyed to find a fistulous opening which would not close. He put the woman under an anesthetic at home, and removed quite a large-sized piece of gauze, after which the patient did well. By simplifying methods, using as few sponges as possible, counting them, and being careful to remove them, we would not have as much trouble as in the past.

DR. WALTER B. CHASE, of Brooklyn, said that "eternal vigilance is the price of liberty," and undoubtedly this rule applied in surgery as elsewhere. He was sure that it was a practical question with every surgeon not to miss a sponge, if it could be possibly avoided, although many men had found it necessary to reopen the abdomen afterward on account of some foreign body having been left in it. It had never been his misfortune to have met with that accident. Whatever method would accomplish the purpose of guarding against the leaving of foreign bodies in the abdominal cavity should be adopted. It was hardly possible to expect all men to pursue the method some other man did. One should be careful of what he was going to do. He should have some method whereby the use of addition and subtraction he could keep track of all sponges used, and it seemed to him that while the method described might appeal to others, it hardly appealed to him. Dr. Hayd had referred to simplicity, to the use of as few sponges and instruments as possible, but he thought that if one made it a rule in abdominal surgery never to leave inside the abdominal cavity a foreign body, such as a sponge, and charged his mind with it when he began, and had his assistants appreciate that fact, he would not

likely leave it in the abdomen. He would like to see the method described carried out, but he thought it was largely a question of the individual operator, who was perfectly satisfied that he had not made a mistake.

DR. CROSSEN, in closing the discussion, said that the question of simplicity in surgery was one of the most important surgeons had to deal with. The number of sponges used in operations was a much greater departure from simplicity than five strips of gauze. It was the simplicity of the method on which the author laid stress. He dealt with only five strips of gauze, and in many cases with only three, and with these strips all the sponging was done. There was no running here and there for sponges or calling for them; everything was within reach. In well-regulated hospitals, where one could have the assistance of nurses and trained help, there was very little danger, but a good deal of abdominal surgery was not done in these ideal institutions, and the method was simple and practical in such instances.

First Day, Afternoon Session.

THE MOBILITY OF THE PATIENT AFTER LAPAROTOMY.¹

BY

WALTER B. CHASE, M. D.,
Brooklyn, New York City.

Visiting Surgeon Bethany Deaconesses Hospital; Consulting Gynecologist Long Island College Hospital, Nassau Hospital, and Jamaica Hospital.

MUCH has been written and more has been said about the governing principles and the technic of abdominal surgery in all its bearings; but it is my purpose to speak of one feature of postoperative laparotomy—that of the mobility of the patient; and that will embrace both passive and voluntary exercise. At the best the patient unavoidably suffers more or less annoyance and pain succeeding the operation, continuing a longer or shorter period according to the circumstances of the individual case, and this fact imposes on the operator an obligation to minimize the suffering.

In the early period of abdominal surgery, great attention was paid to the physical quiet of the patient, and rigid measures were adopted to ensure immobility, both active and passive, as essential to the best result. Longer experience has demonstrated the needlessness and injury of such extreme restriction. Then and, too often, now no latitude was given to the inclinations of the patient; but rigid immobility was ruthlessly enforced.

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

After the operation the patient was placed flat on the back, the hands kept under the blankets, the head lowered to the level of the body, and the legs were maintained fully extended. This was a refined species of cruelty, needless and injurious, and only equalled by Treves's deadly thirst considered as essential to the highest chances of recovery after abdominal section.

Such directions, and many less arbitrary, should find no place in the after-management of laparotomies. The supporting of the head on a pillow is a most gracious relief to the tension of the recti muscles, and such mobility of the trunk and the extremities, active or passive, as will tend to the actual comfort of the patient; particularly the rolling of the patient from side to side, be it never so little, supported with incompressible bolsters under the mattress, together with elevation and support of the knees to relieve abdominal tension, are both reasonable and salutary, when allowed under proper precautions. Such has been my practice for years. But now the reaction has gone dangerously far in the opposite direction, until some surgeons advocate and practise having the patient sit up the day after the operation and walk about the room the succeeding day, allowing the patient to leave the hospital at the end of the week. It is this radical innovation to which I raise a protest; and for reasons which I believe are rational and logical and in keeping with the physiologic and pathologic conditions present.

The cardinal prerequisites for the prompt healing of wounds are perfect coaptation, perfect rest, and freedom from infection; and whatever tends to interfere with such results deserves unqualified condemnation. In intestinal anastomosis, and when intraabdominal suturing is needful, on structures more or less pathologic, voluntary movements of patients must be restricted. The contractility of the recti and transversalis must be diminished by adhesive plaster or the many-tailed bandage. The muscular contraction incited by active or passive motion is not lost or obliterated, but with every degree of mobility of the trunk the healing process may be disturbed.

In the light of experience every operator knows that whether from conditions intrinsic to the case, or from anatomical or accidental causes, hernias from imperfect union too often mar the result of an otherwise satisfactory operation. The time required for healing of the external structures in abdominal sections, must be considered. There is authoritative basis for the statement, that under favorable circumstances the healing of these structures

by first intention, may be completed in eleven days, but a somewhat longer period is requisite for this process to have acquired its full measure of resistance to muscular contractions, either active or passive.

In view of this fact, it seems remarkable that sound judgment consents to the early mobility of the patient in getting up or out of bed. If healing is delayed from any cause, then the time in which mobility, either partial or complete, should be permitted, would depend on the individual case. Doubtless time will give us more information in the relation to the frequency of imperfect scars and in the development of hernias from these causes. As pertinent to the healing of wounds which involve the peritoneum, the experience and result obtained in hernia operations at the New York Hospital for Ruptured and Crippled is most instructive, and demonstrates how immobility of the parts by the application of plaster or other immovable dressings has yielded results so conservative and satisfactory as to make comment unnecessary.

In the present status of this subject there are two distinct and divergent views, both having distinguished adherents, and both claiming superior advantages. Without going far in analyzing these conflicting views, those who favor their patients sitting up the day after laparotomy and on the morrow to go about the wards of the hospital, have come forward with the allegation that long continued rest in a horizontal position tends to the development of thrombosis, embolism, or phlebitis.

Boldt makes such a statement which is tentatively endorsed by Polk, and quotes the Mayos as confirming by their observation the diminishing percentage of these complications of these patients getting up within a week from the time of operation. The doctrine of Reis is well known in this relation. This is the crux of the whole matter. Does the early getting up of the patient bear a fixed and determinate relation to these complications? Is it a question of the mechanism of circulation or of pathologic change which is responsible for these accidents? If an authoritative answer to this problem is to be found it must be answered by experience and by hystologic and pathologic demonstration.

As regards the matter of experience every operator, with little or much observation, instinctively turns to his individual experience, the influence of which is one of the most precious guides to right deduction and without which he would become an automaton. When one observer compares his own with another's

experience, some light will shine on the point in dispute and when the combined experience of many is analyzed more valuable deductions may be drawn. In appealing to my own experience, I find I have had but one case of phlebitis following abdominal section. During a much shorter period I have known some operators who have had a discouraging percentage of this complication. A pertinent inquiry forces itself on the attention of every operator, whether these cases of phlebitis are not of infective origin, and that the supine or upright position of the patient can be but a contributing factor in the problem. Such a conclusion appeals to me as probable and altogether logical. It needs no prophetic vision to trace the causative relation which exists between phlebitis and thrombosis eventuating in embolism.

Observers like Noble, Baldy, and others, declare phlebitis is not due to prolonged horizontal position in bed. An eminent pathologist has expressed to me his belief that early getting up after abdominal section enhances the risk of thrombosis and embolism and that the accident of phlebitis is due to infection and not to blood stasis. The risk of the accidents mentioned are by no means the only ones to be encountered. Within the year an operator of standing presented several patients to one of the largest medical societies in Greater New York as demonstrating the safety of allowing patients to sit up the day after the operation and be about the hospital the second or third day. No one questioned the accuracy of his statement, but he did not suggest that a committee of the society be asked to examine these several cases and report on the healing of the abdominal incision, and the strength of the abdominal wall.

No one doubts the prompt union of the abdominal incision with the patient out of bed in certain cases, but that such results warrant the inference, or that routine practice justifies the rule that it is better for the patient to be out of bed before the expiration of a week, lacks demonstration. Doubtless both imperfect abdominal support and too early mobility of the patient are frequent exciting or contributing causes for weak abdominal walls and resulting hernias, which are the opprobria of the surgical art. In proportion as the abdominal muscles are quiescent, other things being equal, will healing be facilitated. Mechanical support of the abdominal wall and freedom from voluntary mobility of the body are the prime factors which influence such restoration of the parts. This becomes more appar-

ent when we consider other influences which defeat union of the abdominal incision. Apart from voluntary motion, infection at the time of the operation may be unknown to the operator, together with unknowable intrinsic conditions of the structures which retard or prevent primary union. These may not become apparent until after the lapse of several days, and their injurious influence may be much exaggerated by getting the patient in an upright position during such period. Long continued illness apart from ailments for which the operation was necessary, often requires protracted rest in bed.

These rules apply equally to septic cases in which drainage was had through the abdominal incision. Again, unexpected and sudden death from grave complications and suits for damages, the result of assuming the upright position a few days subsequent to the operation, due, it may be, to causes which, wholly or in part, were independent of the disease for which the operation was done, must restrain the conservative operator in pursuing a course, which has in it so much that is fanciful and so little that is practicable. When the physical and pathological rules bearing on these conditions have been properly adjusted, it is confidently believed a middle ground will be found on which all but extremists can stand. In the majority of patients active exercise out of bed may be allowed during the third week after operation; others will make a satisfactory getting up somewhat earlier, while with others a month must elapse. This is a matter of judgment in an individual case. One of the mischievous influences, which has grown out of the new dogma, is reflected in the sentiment of occasional operators who apparently cherish a belief that they are adding to their reputation by reporting that their cases are up and out at the end of a week.

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DISCUSSION.

DR. ALBERT GOLDSPOHN, of Chicago, could not resist the temptation to remark that the principal motive on the part of men who advocate the early getting up of patients after operations was very much the same as that of the grocer when he sold sugar for less than it cost him in a show window. It was something of a novelty, something to attract attention. This kind of notoriety honest and scientific men had better not seek. Advertising in that manner or any other should not be indulged in.

As to the impropriety and utter wrong of inducing these people to get up on the second or third day after laparotomy, there could hardly be any question, if we considered the principles of the healing process, either primary or secondary union,

or if we considered the minute processes that went on with the ligature, whether it be absorbable or nonabsorbable, and that surgeons operated for things more important even than the getting of union of an abdominal incision and the absence of hernia. A patient was not operated for the purpose of making a show, but there were much more serious things, and if the whole procedure, the surgical risk, the loss of time, the expense was rewarded by the greatest amount of good of actual improvement in health, then the surgeon must wait, not simply until there was perfect union and perfect exercise of all muscular play in the abdominal parieties, not simply because the sutures were holding things together, or because there had been serious union, but until cicatrization was fairly complete, and that certainly was not possible in less than ten days. He thought surgeons had erred in keeping some patients in bed unnecessarily long. But even if they were, how much were they harmed in health, extremities and trunk? What injury had come to their muscular system or osseous frame from lying in bed a few days longer than was actually needed? What happened to these patients when they remained in bed with a fractured limb? Did a long stay in bed take away their strength, their health, or detract in any way from their strength or vitality? He failed to see it. Extremes in either direction were a mistake, and the extremes of stimulating and prodding patients to get out of bed so soon after abdominal operations were advertisements to be avoided.

DR. DANIEL H. CRAIG, of Boston, referred to postoperative phlebitis and thrombosis, and said that early mobility of a patient after operation certainly had a relationship to the postoperative complications of phlebitis and thrombosis, and he thought early mobility of a patient lessened the liability to those complications. He had established in his own mind what was really a fact, that the old dictum that infection was the cause of postoperative phlebitis and thrombosis was not necessarily true. It might be true in some cases. For a long time there was a middle ground in which all the other surgeons' cases were infectious, while ours were not. He thought some of our cases were infected, and some of the other fellows' were not.

It appeared to him that to lay down any arbitrary time for keeping patients in bed after operation was entirely wrong. If we were going to lay down a rule for the guidance of tyros in the profession, we had better lay down rules to keep patients in bed for a long time. If rules were laid down for the use of competent surgeons, the individual man's judgment in the individual case must be the rule. It was perfectly safe to allow some patients to get up early, while it was unsafe to allow others to do so, and this should be the basis on which the surgeon should work. For months he had allowed certain patients to get out of bed on the third day; others were allowed to get out of bed a day or two later. He had kept some patients in bed twenty-one days, but either rule would have been foolish if

applied to the other patient. It was not possible to lay down rules. One of the wisest guides, other things being equal, was the patient's inclination. Given a patient without elevation of temperature or acceleration of pulse, good healing of the wound, everything in a satisfactory condition, if that patient felt well enough and expressed an inclination to rise in bed, other things being equal, he would let her get up. If she did not suggest it, he seldom urged it. On the other hand, it was safe to keep her in bed if it was not for too long.

ECTOPIC GESTATION WITH VIABLE CHILD; WITH REPORT OF THREE CASES.¹

BY
X. O. WERDER,
Pittsburg, Pa.

WHILE ectopic gestation is a comparatively common occurrence, the fetus rarely survives the first two or three months of its existence. Rupture of the ovisac usually takes place within the first two months of gestation, and with it or even before that the fetal life is terminated. Occasionally, however, through some fortunate accident, the ovum is not completely detached, at the time of rupture, from its original site and the placental circulation remains undisturbed. In such instances new attachments between the ovisac and the structures with which it is brought into contact are formed, enabling the fetus to survive the catastrophe and to continue its growth until it reaches the period of viability, unless a new or secondary rupture terminates its existence before that advanced stage of development is reached. In spite of the most unfavorable conditions in which the ectopic fetus finds itself placed under such circumstances, cases in which the viable period has been reached are no longer so extremely rare as Sittern ("Ergebnisse der in den letzten 20 Jahren durch Kōliotomie bei lebendem Kinde operirten Fälle von vorgeshrittener Extruterinschwangerschaft," *Archiv für Gynäkologie*, vol. lxxxiv., Heft 1) has recently been able to collect 145 cases from literature in which a living fetus of viable age has been delivered by means of operation. This number could be greatly multiplied were the cases considered in which dead fetuses of advanced age, either macerated and decomposed or in the form of lithopedion, have been removed by operative intervention.

Extrauterine pregnancy with a viable fetus is still, however, of sufficient rarity to command more than passing interest, par-

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ticularly as there are many questions, especially in regard to the treatment, which have by no means been finally settled, and any case of this character may, therefore, help to contribute to a more definite knowledge of this freak of nature and its successful treatment. It is for this reason that I wish to put on record the three cases which it has been my unusual fortune to see during my experience and to give the result of their operative treatment.

As the first case was fully reported in the *New York Medical Record*, November 24, 1894, and in the Transactions of the American Association of Obstetricians and Gynecologists, only a brief review of the most important features will be submitted.

CASE I.—Mrs. F. McC., age thirty-five, referred by Dr. Wallace, of East Brady, was admitted to Mercy Hospital, January 23, 1894, when the diagnosis of extrauterine pregnancy with living fetus of six months was made. Operation was deferred in the interest of the fetus until April 4, when she was delivered by abdominal section of a living child. It was contained in a sac to which numerous loops of intestines were adherent and which terminated between the folds of the broad ligament. The attempted extirpation of the sac was interrupted by a frightful hemorrhage from the placenta; while my assistant used sponge pressure over the placenta, I rapidly clamped the ovarian artery in the left infundibulo-pelvic ligament and with another forceps clamped the branches of the uterine artery along the left border of the uterus, which at once controlled the hemorrhage so that the placenta, which was spread out over the spinal column and the right posterior wall of the pelvis, could now be separated with comparatively little loss of blood. It was, however, impossible to extirpate the sac entirely, as a portion of it was so firmly attached to the intestines that a complete separation had to be abandoned. The freed portion of the sac was then excised and the remainder gathered and drawn together, sutured to the parietal peritoneum and its cavity drained by a strip of iodoform gauze. The abdominal incision was then closed, excepting at the point of drainage. The patient made a smooth and interrupted recovery, and has enjoyed good health ever since. The child, though considerably deformed, was strong and showed considerable vitality and did well for two days. On the third day, however, it became very restless, its breathing became rapid, temperature rose to 104°, in which condition it continued until its death four days after delivery. The cause of death was supposed to be pneumonia, though no autopsy was held.

CASE II.—Mrs. R. B., age twenty-four, referred by Dr. Gentry, was admitted to Mercy Hospital on November 30, 1896. Diagnosis of ectopic gestation at seven and one-half months was made.

Family history negative. Puberty at fourteen, menstruation always regular and painless. Married four years. She had one child twenty-one months ago, labor was very easy and convalescence normal. No miscarriages. Has never been ill of any account. Present illness began in April, when she missed her period, which, however, reappeared May 18. Previous to April, her menstruation had always been very regular.

In September she was compelled to go to bed with "inflammation" for four weeks, and at that time she first discovered quickening. Pains have been very severe since September and more or less constant. On examination the shape of the abdomen was found to be very peculiar and irregular. It contained a large mass about the size of six months' pregnancy filling out the right quadrant more prominently than the left one. Fetal movements could be distinctly felt by abdominal palpation and fetal parts could also be palpated, especially the head, of which the anterior and posterior fontanelles were especially well-marked. The fetus apparently occupied a rather transverse position in the abdominal cavity. Bimanual examination shows the cervix to be soft and flabby and with old lacerations. Parts of the fetus can also be very plainly palpated through the vaginal fornix. The uterus was slightly enlarged and pushed to the left. The point of separation between the uterus and gestation sac could be distinctly felt up to the fundus, excepting at the right cornu. The vagina had a decidedly purplish hue. Fetal heart sounds are most distinct below and to the right of the umbilicus. The patient was thin, anemic-looking, poorly nourished and rather feeble; pulse 100 and above and very compressible.

Operation, December 14, 1896. The abdomen was opened freely and the sac exposed. It was found adherent all around, excepting on its anterior surface. The sac was then opened and the fetus rapidly delivered, scarcely one ounce of amniotic fluid escaping from the incision. The placenta was situated in the lower portion of the sac, spread out over a large portion of the pelvis. Without disturbing it, I at once began separating the sac to the upper portion of which the intestines were adherent. Unfortunately, neither the ovarian nor the uterine artery was accessible, and the plan to secure these vessels, which in the first

case had proved so signally successful, could not be carried out at this stage of the operation. We continued, therefore, to free the sac until the placental site was reached, when a terrific hemorrhage interrupted our efforts. Towels and sponges were used to make pressure upon the placenta, and my assistant also compressed the aorta, while I rapidly finished the extirpation of the sac and placenta with the adherent uterus. The appendix was also found adherent to the sac and had to be removed.

As a large quantity of blood had been lost and the operation was quite tedious, the patient left the table profoundly shocked and with a pulse of one hundred and eighty. In spite of very free stimulation during the next two days she succumbed on the third day after operation. The child's arms and legs were slightly deformed, similar to the first case but to a less degree, but it was more poorly developed, small and very feeble and survived the delivery only a few hours. As this specimen disappeared in some unaccountable manner before a very careful investigation of it had been made I am unable to give a detailed description of the sac and placenta.

CASE III.—Mrs. T. L. M———. Thirty years old. Referred by Dr. Burns, of Washington, Pa. Admitted to Mercy Hospital on September 19, 1907. Diagnosis of ectopic pregnancy at about six months. She has had three children, the youngest four years of age. Last normal menstruation, March 13, 1907. In April she had a slight show which kept up almost the entire month and was accompanied with considerable cramps at times. May 1 she had sudden severe pains in abdomen, which was followed by a slight show lasting only a few minutes. No show at all in June until she had a "miscarriage" about the middle of the month, which was, however, not accompanied by much hemorrhage. Curettement was performed on June 22, cleaning out much placental tissue. Pains kept up in spite of all though she was able to be up and around. For the past four weeks she has felt life and feels a "lump" in the left side. She has not seen any menstrual flow since June.

On examination made by me on September 4 I found the abdomen enlarged to about the size of five months pregnancy the tumor extending closely up to the umbilicus and more prominent on the left side of the abdomen, which it fills more completely than the right side. Fetal movements are very distinct. The uterus is soft and enlarged and posterior to the fetal tumor

but apparently attached to it by the upper anterior surface of the fundus. To the left of what seems to be the fundus is another smaller mass about the size of a goose-egg, soft and attached to uterus and fetal tumor. The fetal tumor is firm and solid and pretty well out of the pelvis. Dr. Burns stated to me subsequently that at the time of curettement not only placental tissue but also a small fetus was removed from the uterus, so that there could be no doubt of a uterine pregnancy complicated by an ectopic.

Operation October 17, 1907. After a free abdominal incision extensive omental and intestinal adhesions (several loops) covering the whole upper aspect of the sac, and also anteriorly and laterally, especially on the right side, were carefully separated. These adhesions were not firm excepting on the upper surface. The tumor was now bare and was carefully inspected. The sac itself was of milk-white appearance, very tense and extended down to a little below the brim of the pelvis. On the right side the sac was evidently covered with peritoneum derived from the broad ligament, containing immense blood-vessels, some finger-thick, running from the pelvis up the right lateral part of the sac to its upper portion. As these vessels were thought to supply the placenta the whole bundle was carefully tied with a double catgut ligature, by passing a slender hemostatic forceps between them and the sac, thus drawing the ligature under the vessels. This mass of vessels was then divided between the ligatures. The sac was then carefully opened in the middle upper portion when the back of the fetus was at once exposed, very little amniotic fluid escaping. The opening was rapidly enlarged with the fingers, the fetus extracted and the umbilical cord, after clamping, divided. The head of the fetus occupied the left lower portion of the sac, while the trunk was in the upper portion curled up in a semi-circle, the lower extremities and the arms occupying the cavity of the circle.

The placenta was now found in the lower portion of the sac quite intact and perfectly dry. The posterior aspect of the sac was now delivered from its adhesions until it could be safely removed from the abdominal cavity. It was now found that the whole sac was attached to the right side of the uterus; the pedicle consisting evidently, partly at least, of the right adnexa and broad ligament, the latter being of course very wide, vascular and thick near its uterine attachment. The pedicle was then securely clamped by three-clamp forceps, cut and tied in sections

by a number of heavy catgut ligatures. The only bleeding of any consequence encountered was right in the beginning when separating omental and intestinal adhesions from the sac. The rest of the operation was very much the same as an ordinary ovariectomy with adhesions. It was easy beyond all expectation. The abdomen was closed without drainage. The patient stood the ordeal very well and left the table in good condition. Her convalescence was easy and smooth and not marred by the slightest complication or disturbance. She has been in good health since.

Report of Dr. Robinson, Pathologist of Mercy Hospital.—Anatomical description: Specimen consists of a fetus, white, female sex, and of placenta. The former measures 39 cm. in length, and has 10 cm. of the umbilical cord attached to which is clamped a forceps. The cranial vault is normal. The left ear is folded on itself, the posterior half covering the anterior half. The left side of the lower jaw rests on the folded arms and has been distorted by pressure so that the face is disfigured. At the base of the second and index finger of the right hand is a reddened discoloration probably from pressure necrosis. The legs are folded and show evidence of pressure which has produced deformities. The right leg lies over the left, the thigh being flexed on the body, the leg directed downward and to the left where the ankle meets the middle of the left leg. Here it is bent around the left leg, the convexity being a little above the ankle on the lateral outer aspect. This produces a marked inversion of the foot and when the leg is extended talipes equinovarus. The opposite leg is more deformed, having adapted itself to the position of its fellow and being beneath suffered greater pressure. The portion above the ankle and for half the distance to the knee bears a depression and the tibialis anticus is atrophied here. The foot is acutely everted and flexed forming a talipes calcaneovalgus. At the flexure in the outer right side is a brownish-black pigmentation. The labia are very prominent, the labia minora protruding between the labia majora. The hair of the head is plentiful and the lanugo covers the body, being especially plentiful over the shoulders.

The placenta measures 15 cm. in diameter having a portion of umbilical cord attached. Four cm. from one margin the amniotic sac is divided equatorially and reflexed. Several prominent blood-vessels and some minor ones are seen coursing over the fetal surface of the placenta. On the reverse, the tissues

are deeply congested, irregular and roughened by numerous delicate fibrillæ or broad fibrous tags. Near the latero-central portion is a prominence of firm, pink substance resembling uterine musculature. Directly beneath is a ridge of firm flexible nature seeming to be continuous with the outer surface of the protuberance mentioned and suggesting the broad ligament in its position and formation. Behind and below the prominence is a semilunar mass, yellowish-pink in color, suspended like a hammock, apparently the ovary. At the outer and upper end of this mass is an irregular rope-like, elongated mass ligated at two places with catgut. At the thickest portion of this mass the more or less patent ends of dilated blood-vessels are seen. This rope-like process extends in a long loop diminishing in size until it reaches the area of what is probably the broad ligament and at this end shows tortuous blood-vessels beneath the peritoneum.

A flattened, pyriform mass accompanies the specimen having been discharged from the uterus by the vaginal route the day following the operation. It is firm, deep red, thickened at the narrow portion and thin at the large end, with a yellowish-white membrane within which some yellow flocculent material is seen. It is evidently a cast of the uterine cavity formed by decidua and endometrium.

That all these cases began as tubal pregnancy can hardly be questioned. The time of rupture can be estimated from the history of every case. In the first case it occurred at about the end of the second month; in the second case it seems to have occurred unusually late, about the middle of the fourth month, and in the third case severe cramps about six weeks after the last menstrual period would indicate that rupture took place at that time, though the complication with normal pregnancy and a subsequent abortion causes the symptoms to be rather mixed and consequently less definite than in the previous cases. In none has there been any evidence of a secondary rupture, though what seems to have been the primary rupture in the second case may in reality have been the secondary one, which would account for its late occurrence. In all these cases the fetus was contained in a distinct sac, in the last one possibly in its original amniotic covering. They all contained a scanty amount of amniotic fluid, not more than a couple of ounces at most and the sac in all these cases was tightly drawn around the fetus. The placenta, which in all ectopic cases is considerable larger apparently than in a normal uterine pregnancy, was spread over a large area. In the

first two cases it involved even loops of intestines, but fortunately not very extensively so that its enucleation aside from the hemorrhage proved technically difficult only in the second case.

In none of these cases was the diagnosis attended with great difficulty. In the advanced form of extrauterine the only other condition with which it might be confounded is normal uterine pregnancy. Mistakes in diagnosis are therefore less likely to occur than in the earlier forms of ectopic gestation, though even the latter cases are not usually difficult to recognize. The peculiar, irregular outline of the tumor, the very easy palpation of the fetus which seems to be almost directly under the skin of the abdomen, and the very audible heart-sounds as compared with uterine pregnancy, are such characteristic features of the extrauterine location of the child that they alone would suffice to attract our attention. In addition to this in the first two cases a part of the fetus occupied the lower portion of the pelvis and was so easily felt by the examining finger in the vagina, that it appeared that only the mucous membrane of the vaginal fornix separated it from the vaginal canal. The only difficulty experienced in the examination was the marked tenderness over the whole uterine tumor, necessitating very gentle manipulations and making firm pressure impossible without anesthesia. This unusual sensitiveness may, therefore, also be regarded as an important factor in the differential diagnosis between uterine and ectopic gestation. In all cases the uterus was considerable enlarged, the cervix softened and rather patulous as in uterine pregnancy, with some of the purplish discoloration of the vagina that is peculiar to that condition, though less pronounced than in an ordinary pregnancy. On bimanual examination the lower two-thirds of the uterus could be felt as quite distinct from the tumor, particularly with a little traction upon it with a tenaculum forceps hooked into the anterior lip of the cervix. Under anesthesia the whole fundus uteri could be palpated excepting at the side where the cornu became blended with the fetal tumor.

While it is, therefore, usually not difficult to recognize extrauterine pregnancy when it really exists I have in several instances been greatly puzzled by cases in which ectopic gestation had been suspected but which turned out to be a uterine pregnancy. In these cases there was a very atypical relaxation of a part of the uterus, that part which contained the fetus, while the other half was firmly contracted and hard. The uterine walls surrounding the fetus seemed to be as thin as tissue-paper so that they

could not be felt at all, and fetal parts could be palpated as being immediately under the abdominal skin, just as described in the ectopic cases, while the contracted portion of the uterus gave the impression of an unimpregnated womb. If repeated examinations did not clear up the matter, I have in several cases succeeded in recognizing the true condition by gently introducing one finger into the relaxed and dilatable cervix, pushing it up to the internal os where I was able to make out the intact amniotic sac. As no harm resulted in any of these cases from this maneuver, I can recommend it as a safe, satisfactory, and perfectly reliable means of establishing the exact diagnosis in such truly puzzling cases which have in not rare instances remained unrecognized until the abdomen was opened.

In the first case the operation was postponed until one or two weeks before the end of term, but on account of the marked deformity of the well-developed child delivery at an earlier period was thought more desirable, because by the absorption of the liquor amnii during the last months and the greater size of the fetus, compression of the latter by the surrounding structures would be more liable to cause deformities which an earlier delivery might prevent. While this supposition proved correct in the last two children delivered at seven and one-half months, this advantage was more than counterbalanced by the lack of development, general weakness and poor nutrition shown in the last two cases which have demonstrated to me that an ectopic fetus, which under the most favorable circumstances is at a great disadvantage compared with a child of uterine pregnancy, has very little chance of living when delivered prematurely. It is, therefore, unwise and very dangerous to the child in whose interest the operation is deferred at all, to deliver it much before the end of term.

It may be asked, why postpone the operation at all when the diagnosis of advanced ectopic gestation has been definitely made in view of the fact that ectopic children have so little chance of surviving their birth, while on the other hand the mother is not only kept in anxious suspense for weeks and months, but is also exposed to some danger from rupture and other complications?

Admitting that an ectopic child is illy prepared for life, and that most of them succumb shortly after birth, yet some of them have reached the adolescent period, one at the last report being nineteen and one-half years old. Of one hundred and twenty-

two cases collected by Sittern, sixty-three survived the first month. It seems to me, therefore, that the child has some right in this condition, provided that the mother's life is not unduly jeopardized by the delay. The greatest danger to the mother is undoubtedly from a secondary rupture of the sac. That this, however, is comparatively rare is shown in Sittern's statistics who is authority for the statement that among 579 cases in the second half of ectopic pregnancy, including 179 with viable child, only in 7.4 per cent. secondary rupture occurred.

The life of the mother is, therefore, particularly when under careful and close observation as such a patient always should be, not often very seriously endangered by the delay required to obtain a living child. Neither is the operative mortality greatly increased by postponing the operation until viability of the fetus is reached. I personally at least would favor, therefore, in justice to the child postponement of delivery to as near the end of term as the safety and well-being of the mother would permit.

In all these cases the placenta was removed with the sac, completely in the last two cases, while in the first a small remnant of the sac which was very intimately attached to the intestines, was drawn together, stitched to the abdominal incision and drained. No drainage was used in the last two cases. This brings us to the very interesting subject of the treatment of the placenta and sac. Even at the present time there is a great diversity of opinion as to the best and safest method of dealing with these important products of ectopic gestation. The placenta particularly has been the stumbling block in the treatment of this condition, and the principal reason of this has been the great danger of uncontrollable hemorrhage from these structures during operation. This fear of fatal bleeding has deterred the older surgeons from operating on cases of advanced extra-uterine pregnancy until after the death of the fetus, when the placental circulation ceases and the danger of hemorrhage is considerably diminished. Even at the present day this method finds some advocates, though the number is constantly diminishing. Very recently (*AMER., JOUR. of OBST.*, February, 1906) Charles A. L. Reed advises to wait, if no urgent symptoms are present, until two or three months after the fetal death as by that time the placental blood-vessels are mostly obliterated. A delay beyond that period he regards as injudicious because absorption of decomposed products from the fetus might give

rise to symptoms of intoxication, and advanced destruction of the soft parts might expose the patient to pains and mechanical irritation from the loosened bones.

The laudable desire to deliver a viable child has influenced surgeons, however, especially in recent years to overcome the difficulties connected with the placenta and sac in various ways. Some, after delivery of the child, left the placenta and sac undisturbed, sewing the latter to the abdominal walls and draining it. The result has almost invariably been sepsis and secondary hemorrhage, so that Lusk very properly said of these that "the fortunate results belong to the domain of miracles and do not invite to imitation." In view of the fact that a dead fetus with sac and placenta has often been carried in the abdomen for years without any very serious accidents, it was tried to imitate nature by leaving the placenta and sac after the delivery of the child without draining it, that is closing the abdominal cavity completely over these structures after operation. The results, though tried in only a few cases, were not encouraging. Most of the cases became septic subsequently and in spite of reopening the abdominal cavity, proved fatal.

The only rational treatment, therefore, seems to be the entire removal of the placenta and sac whenever possible, or at least the placenta and as much of the sac as can safely be extirpated, leaving as little foreign material as possible in the abdominal cavity to invite sepsis and other disturbing elements, during the patient's convalescence. The cases in which this procedure is not possible should in my opinion be very rare, provided all necessary precautions and safeguards against that one great danger in this operation are made use of—namely, uncontrollable hemorrhage from the placenta.

The placenta derives its blood-supply mainly from the ovarian artery and its anastomosing branches of the uterine artery. If we succeed in controlling these two arteries at the onset of the operation, immediately after the delivery of the fetus no excessive hemorrhage need be feared, as was demonstrated very conclusively in my first case. The most terrific bleeding was immediately under complete control after clamping the infundibulo-pelvic ligament on one side and the vessels leading from the uterine cornu on the other. We should endeavor, therefore, to get at these important vessels as soon as possible with as little disturbance of the sac and placenta as practical. Unfortunately these arteries are not always easily accessible as I

learned in my second case. The fetal tumor completely blocked the pelvis above the uterus, so that the latter could be located only after extensive dissection and separation of the sac. I was greatly hampered by the frightful hemorrhage from the placenta when brought into close contact with the latter. It is, therefore, not always possible to secure these arteries in time to prevent hemorrhage and possibly to save the patient, and in such cases compression of the abdominal aorta is the only means we possess to control this truly alarming bleeding. This was resorted to in my second case but unfortunately not until the patient had lost a large quantity of blood. To anticipate this accident I should, therefore, in the future, at least in all such cases where the ovarian and uterine arteries cannot be reached very promptly, use compression of the aorta as a prophylactic as soon as the delivery of the fetus is accomplished.

As digital compression is not entirely satisfactory for various reasons, some other mechanism should be substituted which effects compression of a wide section of the aorta, the object being temporary occlusion of the artery without injury to its walls or lumen. Surgeons have been experimenting in this line for the treatment of abdominal aneurysms and Halstead (*The Result of Complete and Incomplete Occlusion of the Abdominal and Thoracic Aorta by Metal Bands. Journal of the American Medical Association*, December 29, 1906) has devised a metal band which can be left on the aorta for hours, even days, without damaging its coats in the least. This he has demonstrated by numerous experiments on dogs and in a few instances has applied this method also on the human subject. He, as well as others, has demonstrated that such compression can be kept up for hours with safety and without fearing serious complications. There is, therefore, no reason why it should not be adopted as a means to control the bleeding and prevent the disastrous hemorrhage so much dreaded in dealing with the placenta in these cases.

My plan of procedure in advanced ectopic gestation, especially when the sac fills up the pelvis and when it is impossible to gain early access to the uterus and the ovarian and uterine arteries, would be to begin by exposing the abdominal aorta, encircling it by means of Halstead's metal band or an ordinary broad clamp whose branches have been protected by rubber tubing, such as an intestinal clamp. This should, however, not be tightened until after the delivery of the child, as too early occlusion of the vessel might jeopardize the life of the fetus by

prematurely cutting off its blood-supply. The complete extirpation of sac and placenta could now be effected without undue haste and without fear of hemorrhage. Even those cases in which a part of the placenta has become engrafted upon loops of intestines should not necessarily decide us against completing the radical operation, because resection of the damaged intestine whenever such should be required, could be resorted to, as was done by McDonald in a similar case.

Having, as I firmly believe, in the prophylactic instrumental compression of the abdominal aorta a safe and reliable means to prevent the so much dreaded placental hemorrhage, which has really been the principal stumbling-block in the surgical treatment of advanced ectopic gestation, there seems to be no longer any juster ground than radical operation in this condition, consisting in the complete extirpation of the gestation sac with living placenta an operation which, in my opinion, is the only proper and correct surgical procedure for these cases.

524 PENN AVENUE.

SOME EXPERIENCES WITH EXTRAUTERINE PREGNANCY AND REPORT OF CASES.¹

BY

HERMAN E. HAYD, M.D., M. R. C. S. (Eng.).

Buffalo, N. Y.

THE importance of this subject, together with its very frequent occurrence and the now universally accepted surgical treatment of the condition, has prompted me to write this paper, in which I shall try to deal briefly and practically, with a few phases of the question and give the conclusions which have been forced upon me as a result of an experience with seventy-three cases, in all stages of development, and perhaps with all possible complications and difficulties. After studying my records, they may be conveniently grouped into certain distinct and separate classes.

First.—Those in which rupture had not taken place.

Second.—Those in which sudden rupture occurred and a large vessel was opened, or a tubal abortion in which the bleeding continued freely into the peritoneal cavity, and where there was no tendency to localization of the hemorrhage or the formation of a hematocele—the so-called tragic or cataclysmic cases.

Third.—Cases in which rupture, partial or complete, had

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists at Baltimore, September 22-24, 1908.

taken place—including tubal abortion, partial and complete—and where upon operation a large pelvic hemocele, more or less completely encysted, existed and where the ovum was so small that it either escaped observation or it was broken down in the blood-clots which were in the sac contents. In this group can also be included those cases where the rupture took place on the under surface of the tube and the blood escaped into the folds of the broad ligament, producing a broad ligament hemocele which, in my experience, is a rare variety and cannot often be diagnosed until the abdomen is opened.

Fourth.—A group where rupture took place, but where the ovum continued to grow, say up to the fourth or fifth month, either within the peritoneal cavity or between the folds of the broad ligament, because it was not completely detached at the time of rupture, or because it made a new placental attachment.

Fifth.—A class where the conception product broke down more or less completely and formed a pelvic abscess, or where its contents—pus, bones and débris—were being discharged either through the vagina, rectum, bladder or abdominal wall.

Sixth.—Where the fetus went on developing until it was viable or to term, and was then delivered by operation; or it died during labor and was finally removed as a lithopedion or other degenerated product.

Any form of pregnancy outside of the uterus is termed extra-uterine, and so far as we are interested, clinically, anatomical distinctions are of little value; because it matters not whether the condition be one of tubal abortion or rupture in any part of the tube or cornu, the symptoms are practically the same and their relief must usually be brought about by surgical intervention.

The diagnosis of ectopic pregnancy before rupture takes place is seldom made because the cases do not come under observation early enough, and usually when a specimen is obtained early, it is because an operation was undertaken for some other condition, or where a tentative diagnosis was made with merely a suspicion of tubal pregnancy, because a slightly distended tube, whether by serum, blood or pus or an aberrant ovum, may give the same objective and subjective symptomatology. However, any tense, elastic and painful swelling of the tube, particularly when the swelling is confined to one side, and with a uterus reasonably movable, should always make the surgeon suspicious, especially if the period has been delayed, or if there has been present some

irregular bleeding from the uterus. Pus in a tube, especially if slow in development, is usually associated with considerable exudate, and therefore, more adhesions exist than are generally present with an early extra-uterine pregnancy. Hydrosalpinx, in my experience, is comparatively rare, and hematoceles of the tube are most often the result of a slightly or completely detached extrauterine ovum, hence we are justified in making this general statement—that any tense, elastic and painful swelling of the tube may be, and often is, an early extrauterine fetation, and should be most carefully watched, as an operation may become necessary at any moment.

In the examination of these women much care must be exercised, as the sac often ruptures as a result of the manipulations. This accident occurred to me once in one of my patients, whom I was examining in my office. She came, complaining of severe pain in the left side which made walking painful. During the examination I felt a painful, tense tumor in the left ovarian region, and while I was performing bimanual palpation, she was suddenly seized with an acute cramp-like pain; was nauseated and became faint. I removed her at once to the German Hospital, and opened her abdomen, which contained a large amount of free, red fluid-blood. The left tube had a rough, irregular tear near the fimbriated end, from which blood was flowing very freely. The ovum had escaped into the peritoneal cavity. The patient made a very rapid and excellent recovery.

A second patient, which may be placed in either the first or second groups, I saw in consultation with Dr. Gibson to whom I referred the case, and as the history is exceedingly interesting though a very common one, I shall give it briefly.

Mrs. W., aged twenty-five, married two and one-half years; a fine, healthy English woman who had always been well and regular but at the last period flowed rather profusely. She sent for a neighboring young doctor, who thought she had a miscarriage, and proceeded at once to curette her, which he did without an anesthetic. Two days after this so-called curettement I saw her, and upon vaginal examination, discovered a small globular swelling in the left side, tense and painful. The uterus was tender, and pain was elicited upon gentle manipulation. I enjoined rest; applied poultices, and gave a little codeia to relieve the pain. She had a temperature of 100°. Upon the following day I saw her again, and turned the case over to Dr. Gibson, directing him to pay particular attention to a possible extrauterine fetation. As

there was still some temperature I felt that a few days should be taken to eliminate the swollen tube as a result of infection from the traumatism consequent upon the curettage. Dr. Gibson reported that the patient was doing well, and that the husband had requested him to discontinue his visits, as he thought them unnecessary.

Four weeks after my first visit I was again called to the patient's house, as she was suffering great pain and had been in much distress for some days previous. Upon examination it was at once plainly evident that she was suffering from a large encysted hematocele, the result of a ruptured tubal pregnancy. I removed her to the German Hospital, and under chloroform, opened the culdesac and let out over a pint of black blood and blood-clots of various sizes. The cavity was thoroughly irrigated with salt solution, and a piece of gauze was lightly packed into the vaginal cut for drainage. She did well for one week, the temperature remaining normal, and then she began to complain of a good deal of pain, there being a constant elevation of temperature of a couple of degrees. On January 12 I opened her abdomen and removed a large stinking mass, which was a ruptured tube with more or less organized broken-down blood-clot. A gauze drain was placed low in the pelvis. She reacted nicely and did well, and on the thirteenth day, with normal temperature and normal pulse and bowels moving freely and good appetite, I left her in the care of one of my hospital associates, and took a trip East.

On the seventeenth day trouble was noticed with her bowels, it being impossible to move them with gentle purgatives and injections, and she was always suffering from cramp-like pains, but gas was still passing. I returned home February 3 and found her in a bad condition, crying with pain and much distended by gas, although a little gas occasionally passed naturally, but always with great pain. The bowels had not moved in six days, but there was no vomiting. I placed her at once upon the operating table, as it was evident a partial obstruction was rapidly becoming a complete one, and under chloroform anesthesia I reopened the abdominal wound and released a number of adhesions, separating and uncoiling a bad angle which existed in the pelvic sigmoid, and quickly closed the abdominal incision. She bore the operation well, and the bowels moved on the second day; she continued to do nicely, and made a most satisfactory recovery, and she is now a fine, strong, handsome young woman.

If we review this case, we should see that outside of the obstruction of the bowels, the history is quite common, and my notes record many cases which were mistaken for a miscarriage and were curetted by the attendant before the diagnosis of extra-uterine pregnancy had been made. No doubt the slight temperature which existed and especially the pain upon examination, which I observed at my first visit, was increased by the curettage, but I felt positive that the swelling of the tube was a tubal fetation. However, she got better for a short time, and then no doubt a slight rupture of the tube took place, or the trophoblasts had bored and eaten their way through the tube-wall and made small openings which permitted slight hemorrhages; these increased in amount and frequency until a large encysted hematocele resulted.

The second element of interest and of most importance to us, and what I trust this paper will provoke a good discussion upon, is what kind of surgery shall be employed and where shall the attack be made? There is not any question in my mind that free vaginal incision will cure many of these early cases, but I believe it is only good practice when the hematocele is recent, the blood not too strongly organized in the sac, and where there is no fetal product to be disposed of. If the condition has existed some time and the blood has become organized into more or less indissoluble bands, as this case of mine was, it is a better practice to do a combined operation at the one sitting. First, incise the culdesac and empty out the sac contents, irrigate thoroughly and then open the abdomen and remove the whole mass. By first emptying the sac through the vagina, its walls collapse more or less; the bowel adhesions are more easily separated and the dangers of breaking the cyst-wall and soiling the peritoneal cavity are reduced to a minimum. Vaginal drainage alone, when the case is not recent, implies a long convalescence, often a long run of fever, and for weeks a very dangerously sick woman, and often in the end a second operation to remove the unabsorbed mass with necessarily a high mortality.

In the second group, or tragic class, as Vineberg in a recent paper in the *Medical Record* discusses, are among the most terrible pictures the surgeon is called upon to care for. The symptoms are so sudden and terrific that a mistake in diagnosis should very rarely be made by any medical man with any experience. Some men have recently advocated a waiting policy, but I am not persuaded that it is good practice. On the con-

ary, in my view, an operation should be performed at once, and salt solution should be slowly and continuously injected into each breast throughout the whole operation, and to this solution adrenaline can often advantageously be added. One can never tell how much blood has been poured into the abdominal cavity, as pulse, hemaglobin count, or any other recent scientific deduction gives us practically no assistance. I have operated upon patients cold and pulseless, and have been surprised to see the pulse immediately come up as soon as the abdominal cavity was opened and the intraabdominal pressure relieved by the terrific gush of blood which came through the incision. The broken tube must be quickly found, and a clamp forceps applied and tied off with the greatest dispatch, and the abdomen closed with a few through-and-through silkworm sutures.

The operating room should be very warm, and, if possible, the patient should lie on an electrically heated table, or any device that will keep up the body temperature should be continuously employed. Strychnia, digitalis and any recognized means of stimulation are to be used, and the patient is placed in bed, with the legs elevated. I have never had a patient in this condition die upon the table, and I cannot believe any have ever died by reason of the extra shock imposed by a rapid operation, who would not have died had no operation been performed, and the sense of well-being and comfort which comes to a surgeon who operates such a case and gets the women off of the table is, indeed, very great. To stand by and anxiously look for a favorable turn, with all of its uncertainties before an operation is undertaken, is one of the most harrowing experiences I have ever subjected myself to; and, therefore, it has been my practice to operate at once every such case, no matter what condition I found the woman in, and my percentage of recoveries has been encouraging.

As a rule, the technical difficulties of such operations are not great, as adhesions are not usually present, and no amount of diagnostic skill and acumen can foretell whether an operation will be difficult, and no tests or signs which are revealed by pulse and respiration—our usual danger signals—are of much value here, because they do not signify how much free blood exists in the peritoneal cavity, nor how much there still remains in the body blood-vessels; nor how quickly the empty abdominal blood-vessels will drink up the fluid just so soon as the intraabdominal pressure and irritation are removed. In other words, the con-

dition of extreme shock which these women are found in is not alone due to the mere loss of blood into their own belly cavities, but to the great shock to the sympathetic centers, the result of its quick and sudden accumulation in the peritoneal cavity, and every one of us has noticed when operating on these cases, how quickly the pulse comes up and the respirations improve when the black peritoneum is opened and the first sudden escape of fluid takes place. If the above premises and deductions be true, then it seems to me we must come to an incontrovertible conclusion, that the waiting or delay policy of treating this class of cases is not good surgery. However, this, like many other surgical problems, must be solved by each surgeon according to his own light and experience, and the conditions confronting him.

The diagnosis of the third and fourth groups, where hematocele exists and a detached fetus of recognizable size, can usually be easily established if sufficient time is taken to carefully work up the history of the case. The existence of a large swelling, the delayed or absent period, the irregular discharges of blood, pathognomonic in character, tarry, smeary and sticky, as Boldt pointed out in a recent paper, with shreds of decidual membrane, and sometimes even a perfect mould of the uterus, together with shooting pains in the rectum, and with that peculiar bearing down and forcing tenesmus seen in these cases, associated with many of the signs and symptoms of later pregnancy is a familiar clinical picture. Unfortunately, these cases are hurried to the operating table simply because a lump or tumor was felt upon vaginal examination, and a careful study of the symptoms was not systematically made. If the distended Douglas's pouch be opened, old blood or blood-clots, or even pus, will freely flow away, or a digit—or other small bone—can often be pulled out of the mass, and if through this opening the examining finger be thrust, often much other valuable information can be obtained. Sometimes in these more advanced pregnancies, as has happened in a recent case with me, no fluid escaped through the culdesac incision; it was all absorbed and only the fetal and placental product remained. I successfully removed from this woman a four months' fetus which was dead and had partly undergone intrauterine, or better, intraperitoneal maceration, and yet the sac contained very little fluid contents.

The treatment of this group of cases I have already detailed, and I am sure my past five years' experience with the combined vaginal opening and copious irrigation, and then an imme-

diate abdominal section, has lessened my previous mortality materially.

The fifth group simply presented the symptoms of pus in the pelvis, or pelvic abscess, and the history of a possible association with an extrauterine product was often not thought of. The long and painful illness, with the presence of a large and tender tumor, and the usual constitutional and local evidences of pus made an operation imperative. In these cases it is also my practice to first evacuate the pus, if it can be reached through Douglas's pouch, irrigate and then proceed at once to remove the remaining pathology by abdominal section, and drain below through the vagina with gauze or tube, together with properly placed gauze drains above, according to the indications of the case. If there exists above a dirty infected area of considerable size, I usually place a gauze wick or nest in each iliac fossa, removing them on the third to the sixth day.

I have never met an extrauterine fetation that has gone on living to term, nor have I operated upon such a case where a living baby existed; but I read at our last meeting, in Detroit, a paper which dealt with the most interesting case of a lithopedion which I successfully removed from a woman sixty-seven years of age, and which had existed for thirty-two years. And that paper, with photographs, was printed in the December number, 1907, of the *AMER. JOUR. OF OBST.*, is now preserved in the Pathological Museum of the Medical Department of the University of Buffalo.

493 DELAWARE AVENUE.

"ECTOPIC GESTATION."*

BY

CHARLES LYBRAND BONIFIELD, M.D.,

Cincinnati, O.

Gynecologist to Medical College of Ohio; Gynecologist to Cincinnati, Good Samaritan, and Christ's Hospitals.

SINCE 1883, when Tait taught the profession that tubal pregnancy was a condition to be dealt with by surgery, it has been generally believed that every case must be operated on as soon as the diagnosis is made. This has led many conscientious practitioners, with little experience in abdominal surgery, to operate under the most unfavorable circumstances, and while doubtless many lives have been saved in this way, it is probable that many more have been sacrificed. For occasional operators, in fact all operators, are more prone to report their successes

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than their failures. A perusal of current medical literature does not, therefore, give an accurate idea of the true mortality attending the surgical treatment of this physiological accident.

Recently, F. F. Simpson, of Pittsburg, and Hunter Robb, of Cleveland, have in two papers each called attention to the fact that some of these cases can with benefit to themselves wait for an operation until they have recovered from the shock produced by the profuse hemorrhage attending it. It seems to me that both of these gentlemen prove their contention by the cases they report, but Dr. Simpson, by quoting authorities to prove that immediate death rarely follows hemorrhage from other internal organs—lungs, stomach, intestines, etc.—is giving the impression that fewer patients bleed to death from tubal pregnancy than really do. And Dr. Robb by his experiments on dogs which consisted in cutting the ovarian and uterine artery and leaving them unligated, gives the same impression, if we accept his experiments as he evidently does. To me the experiment only proves that dogs do not bleed to death as readily as human beings, for we all know that his experiments could not be duplicated on women with the same results.

That some cases do bleed to death from tubal abortion or rupture is too well known to require extensive argument. One has only to refer to the literature prior to the eighties to find numerous well-authenticated cases recorded. Under a year ago I was summoned less than fifty miles in the country to operate on a case diagnosed by the physician as tubal pregnancy, which had ruptured a few hours previously. I went on the first train and the physician met me at the depot only to tell me that the patient was dead. There was no postmortem to prove the diagnosis, but my experience has taught me, that when a general practitioner makes a diagnosis of ruptured tubal pregnancy, it exists, and the doctor's account of the symptoms in this case left no doubt in my mind as to the accuracy of his diagnosis.

Most of the cases of death from tubal pregnancy which are investigated by the coroners, are those in which an attempt at criminal abortion has been made, and as a result an infection has taken place which was the immediate cause of death. Dr. O. P. Coe, deputy coroner of Hamilton County, gave me the record of the following cases which have recently come under his notice.

CASE I.—Mrs. M. had thought herself three months pregnant and an attempt at abortion by dilatation of the cervix had been made but produced no symptoms. Two weeks later she had

symptoms of hemorrhage and collapse. She rallied and at the end of four days was in good condition. On the fifth day there was a recurrence of symptoms and she died in about three hours after their onset. A postmortem showed a ruptured tube and an abdomen filled with blood.

CASE II.—Miss, age 28, was living in a rooming house. She complained to her neighbors for several days of pain in the lower abdomen. One morning the landlady heard her pounding on the wall of her room and went in to find her in collapse. A physician was summoned who found her pulse 140, temperature 96, respiration 50. He gave her no treatment and in six hours she was dead. Postmortem showed a large amount of blood in the abdomen with rupture of left tube.

It may, therefore, be considered as proven that a certain percentage of cases will bleed to death, unless the surgeon arrests the hemorrhage. What that percentage is, cannot at the present time be stated. There are certainly no valid reasons for assuming, that it is so small as to be a negligible quantity. Any man whose experience has been broad and has not encountered such a case must be considered fortunate. If it is conceded that a considerable number of cases can be more safely operated some hours, days, or weeks after rupture has occurred, than while they are suffering from the shock due to this accident, but that some will die from hemorrhage if operation be delayed, then it is our duty to try to determine what is best for each individual case and treat it accordingly.

For our purpose cases of tubal pregnancy may be divided into five classes. First, those in which a slight hemorrhage occurs at an early period—six to eight weeks—and kills the ovum. Such an ovum with the blood-clot may be absorbed and the patient regain her health. I have long believed that a large number of such cases occur and are never recognized by a physician. The following case represents this class.

Mrs. H., married, mother of one child four years old. Came to my office complaining of pain in lower abdomen and rectum and irregularity in menstruation. A physical examination disclosed a small sensitive mass behind and to the right of the uterus, which I diagnosticated as tubal pregnancy and wrote a letter to her father, who in a physician, urging early operation. I did not see her for two weeks when she returned for operation. Examination showed no apparent increase in size of mass, menstruation was still absent and the uterus enlarged. I

operated on her at the Good Samaritan Hospital April 16, and found a rupture of the right tube, with an old firm clot plugging the opening. There was an intrauterine pregnancy of probably eight weeks' duration. The tube and ovary were removed and it was evident that the ovum in the tube had ceased to grow sometime before. The intrauterine pregnancy was not interrupted and is apparently progressing normally.

In the second class, embracing those in which the rupture occurs a little later than eight to ten weeks, the hemorrhage is so profuse as to cause well-marked classic symptoms, but is not so profuse as to at once menace the life of the patient. In these cases it is not a matter of very great importance whether the patient be operated on at once or be allowed to wait a short time. Few will die in the hands of a skilled man regardless of the course he chooses to follow. There is no reason for the inexperienced hastening to open the abdomen, lest his patient bleed to death. There is always time to secure the assistance of a man skilled in abdominal surgery. Such a patient can also with safety be transferred a reasonable distance to a hospital, where the surgeon is accustomed to work in order that the operation may be done as well as he is capable of doing it. Such a patient should be kept in the recumbent position and no unnecessary examinations of the pelvic organs made. It is seldom that operation in such a case should be deferred more than forty-eight hours, for there is no certainty that the life of the ovum has been destroyed, and another and severer hemorrhage may occur at any time after the blood-pressure approximates the normal. The following case operated on for Dr. Gillespie is a typical representative of a number of such cases I have seen.

Mrs. H., had for four months before the present illness been delivered of a six months' macerated child, that being her ninth pregnancy. I saw her during the third attack of sharp pain followed by symptoms of shock, which she had had in six days. The second attack had been so severe that she dropped on the street while returning from the grocery store. In both attacks she showed evidence of shock, but her pulse was below 60 and full. Dr. Gillespie had suspected tubal pregnancy and I confirmed his diagnosis, but we could not make a satisfactory physical examination on account of her being extremely fleshy. She was sent to the Good Samaritan Hospital for operation and under an anesthetic the physical signs manifested made us sure of our diagnosis. The abdomen was opened, a large quan-

tity of blood was found and an active hemorrhage taking place from a ruptured tube. The hemorrhage was no doubt set up afresh by our examination under anesthesia. The tube, ovary and the fetus estimated at ten weeks were removed and the patient made a prompt recovery.

To the third class of cases belong those which are in immediate danger of death from hemorrhage. This class is not numerous, but it gives rise to practically all the arguments, as to the relative virtues of immediate and deferred operations. In the light of our present knowledge, I think it can be said that for the average operator, the best course to pursue in the treatment of these cases is to operate at once, if the hemorrhage is in progress when he sees the case, and to defer operation if it has ceased.

It will be said that no one can tell if it has ceased or not. This is true sometimes but rarely. In the majority of cases a man can form as positive an opinion upon this point as he can upon other conditions, where he must rely upon the history of the case and the symptoms presented. I quote three cases to illustrate this point.

Mrs. A. was seen in consultation with Dr. E. O. Smith, about eight hours after rupture of tubal pregnancy. Her skin and mucous membranes were blanched, pulse so rapid and thready it could scarcely be counted, abdomen distended, respiration sighing, temperature subnormal. Dr. Smith thought her pulse and respiration slightly better than two hours previously. We agreed that her interests would be best served by delay. After three weeks had elapsed she was thought to be in condition for operation, and was removed to the Good Samaritan Hospital, where Dr. Smith operated on her and she made an excellent recovery.

CASE III.—Mrs. — was admitted to Christ's Hospital complaining of vesical and rectal symptoms and with a small movable tumor in the lower abdomen. When I saw her she had been anesthetized by one of my colleagues for the purpose of examination. I joined in the examination, but the mobility of the tumor misled me and I diagnosed a small solid tumor of the ovary.

I left the hospital immediately but in a few hours was urged to hasten back as the patient was said to be dying. When I reached the bedside her condition was most alarming and all those present believed she had been kept alive by salt water, which had been given intravenously. I opened the abdomen at once and found it filled with blood, a very active hemorrhage

being still in progress from a tubal abortion. There was no doubt in the mind of any one present that she would have died had not surgical aid been so promptly rendered.

Mrs. S., age 25, married six months, was living with her husband at a private hotel in Cincinnati. She was under the care of Dr. Hocker for what seemed to be an abortion. She had passed a membrane with considerable hemorrhage and was making a satisfactory recovery. Five days after this occurrence, one morning about three o'clock, she was seized with severe pain in the lower abdomen and manifested every evidence of shock. I saw her about nine o'clock the same morning and found the lower abdomen filled with fluid, extremities cold, pulse weak and thready, respiration sighing, temperature subnormal. She had had morphia hypodermatically. Dr. Hocker told me she considered her condition better than an hour or two previously. I, therefore, after observing her for half an hour advised that operation be deferred. She was kept perfectly quiet under the care of a good nurse. In about five days her condition was sufficiently favorable to justify operating, which was done at Christ's Hospital, June 25, 1908. The abdomen was filled with blood. The tube which was ruptured in two places was removed. She made an excellent recovery.

It will be seen that my judgment was correct in two of these cases in which I advised delay. They could not have done better from an immediate operation and it was, and still is, my opinion that the slightest additional shock produced by the most expeditious operating would have proven fatal in both cases. My reasons for thinking the hemorrhage had ceased were, the number of hours that had elapsed since the onset of the symptoms and the testimony of my consultant in each case that the patient showed slight improvement. In the other case I had every reason to believe the hemorrhage still active and the patient was already in the hospital where operation could be made without delay. I have had numerous other cases, similar to these which go to prove my contention, that it is often possible to determine whether or not the hemorrhage has ceased. I believe if five or six hours have elapsed since the rupture, and the patient without the absorption of salt water has not lost ground in the last hour, it is safe to assume that the hemorrhage has ceased.

My experience during the last ten years, in which I have done no family practice, has been in almost every case, when I first

saw the patient the hemorrhage had ceased. I presume that this is the experience of every one who sees these cases only as a consultant, for in the majority of cases by the time the family physician has responded to his summons, recognized the condition and got his consultant to the house, time enough has elapsed for the hemorrhage to either cease or destroy the patient.

It is always stated by one or more persons taking part in the discussion of this object, that there is great danger of another hemorrhage as soon as the blood-pressure is restored to something near normal. This is true in cases of slight hemorrhage, but not in the grave ones. At least it has not been my experience, nor has it been the experience of Robb or Simpson according to the report of their cases nor should apriori reasoning lead us to expect it, if the patient is properly treated.

The great loss of blood decidedly increases the coagulability of the blood-stream favoring the formation of a firm clot. It will be days rather than hours before the blood-pressure approaches the normal if it be not raised by injudicious stimulation, so there is little danger of the clot being forced out by the blood-stream. Such a profuse hemorrhage is usually fatal to the ovum, so there is not likely to be another rupture. In case it is decided to defer operation, the care of the patient is exceedingly important. For the first twenty-four hours she should not be allowed to move, the catheter being used to evacuate the bladder and morphia enough given to quiet the nervous system and to make the dorsal position endurable. Stimulants are not necessary and should for the most part be withheld. Nothing is more irrational than to give salt water in the vein unless the bleeding-point has been secured. A limited amount of it may be used in these cases by rectum or under the skin. In a few hours the peritoneum will begin to absorb the fluid constituents of the blood. This is the best possible way to supply the system with that which it most needs.

I know of no other class of patients that recover so rapidly from the loss of a large quantity of blood. The stomach should be kept empty for several hours, then a limited amount of hot fluid may be given. Vomiting might prove fatal by disturbing the clot. Last winter a patient of mine at the Cincinnati Hospital ruptured a tubal pregnancy by a slight struggle incident to taking the anesthetic for operation. After forty-eight hours the stomach can be trusted to take care of a generous amount of easily digested food. It is not necessary or desirable for the

bowels to move for several days, but when they do, they should be assisted by a gentle laxative. Either straining at stool or the use of an enema would be dangerous. Most of these cases will be ready for operation in from five to fifteen days and operation should be done as soon as the patient's condition makes her a good surgical risk.

In the fourth class, there is a living fetus, which has developed to the sixteenth week or later. About fifteen years ago I operated on a case at the sixth month in the Good Samaritan Hospital. The child died in a few minutes and the mother only survived twenty-four hours. Her death was due to loss of blood occasioned by the separation of the placenta from the intestines and omentum, to which a large part of it was attached. It is generally conceded that the life of the child should not be considered if the diagnosis is made before it is viable.

At Christ's Hospital I operated on Mrs. —, who was at full-term and having labor pains. I removed her uterus along with the gestation sac, which contained a living child. The upper part of the head protruded from the fimbriated end of the tube which apparently had not ruptured and which contained all the rest of the child and the placenta. The end of the tube made a constriction around the child's head which was still noticeable the last time I saw it. I exhibited this mother and child to this association at the Cincinnati meeting, two years ago. The child is still living and well. It is about normal in size and possesses a normal amount of intelligence.

In the fifth class we have to deal with the dead fetus, which has attained an advanced stage of development. The death of the fetus renders the operation safer for the mother providing it be not undertaken until a sufficient time has elapsed for change to take place in the placenta. I have operated on two such cases, the first at Christ's Hospital a number of years ago. The patient was fifty years old and had a large fibroid tumor of the uterus and a mass on either side. One proved to be a dermoid tumor of the ovary, the other a sac containing all the bones of a fully developed fetus. After the patient's recovery, she gave me a good history of an extrauterine pregnancy, ending in false labor, her medical attendant having waited several hours to deliver her. This had occurred seventeen years prior to the time of my operation.

July 19, 1906, at Christ's Hospital I operated on Mrs. F. She was thirty years old, the mother of one child three years old. In

August, 1905, she had missed her menstruation and had all the symptoms of pregnancy. In November, there was some bloody discharge from the uterus accompanied by severe pain. After this she noticed enlargement of the abdomen mainly, on the right side. She felt movements at about the fifth month. These movements were attended with an unusual amount of pain. The abdomen remained tender during pregnancy. At the end of nine months there were severe labor pains which lasted about twenty-four hours. After this the movements of the child ceased. The uterus was removed along with a gestation sac containing a fully developed child. She made a prompt recovery. The operation in this case, as well as the one in which the child was living, was greatly facilitated by removing the uterus with the sac.

409 BROADWAY.

DISCUSSION.

The papers of Drs. Werder, Hayd, and Bonifield were discussed jointly.

DR. ALBERT GOLDSPOHN, of Chicago, did not think it right to assume that all cases should be operated on at once. Very many of the cases were not tubal ruptures, but tubal abortions, the ovum slipping out of a somewhat dilated abdominal end of the tube. These cases did not usually bleed very long nor very much, nor did they produce profound shock. The natural course of these was for the hemorrhage to stop, to form a hematoma of limited degree, and there was no danger to life either immediate or remote. Operation was usually advisable in case invalidism resulted more or less from the mass of coagulated blood that would not be entirely absorbed, but would usually form a coagulated entanglement about the ovary—a condition which would require operation later. But this comparatively simple form of the trouble gave symptoms which perhaps would only call for vaginal section. When it was known that the hemorrhage had stopped and the hematoma was accessible, it could be emptied by the vagina afterward, making the proper incision for vaginal drainage. That much was certainly true in regard to these tubal abortions, and the declaration made by the lamented Saenger before the Medical Congress, in Rome, that so-called hematoceles were usually and, as a rule, tubal abortions he thought was pretty nearly right. On the other hand, it was not safe to assume that all ruptured tubal pregnancies were going to stop bleeding, for death sometimes ensued. He had observed two such cases as long as twenty years ago, when surgery was not advanced and the proposition to operate not so readily assented to. Death followed rupture and autopsy showed the cause. Death occurred inside of twelve hours in one case, and in less than twenty-four hours in the other. But the cases of ordinary tubal rupture which would not stop bleeding

were few. In some instances the tubal ruptures were so slight that hemorrhage might stop under rest-treatment; therefore, in these the proposition to operate at once was out of order. As pointed out by Dr. Bonifield, in many cases one could feel his way and be convinced that hemorrhage had ceased, and then the patient could wait, be transported to a proper place, and put into the hands of a competent operator, and such a woman would probably do better than if a surgeon had opened her abdomen as an emergency case.

DR. C. C. FREDERICK, of Buffalo, said that a week ago he did his one hundred and thirty-third operation for ectopic pregnancy. He took part in a discussion at the American Gynecological Society, in Philadelphia, in May, on a symposium in which Dr. Robb, of Cleveland, laid down the question of immediate *versus* deferred operation for ruptured tubal pregnancy. At that time the speaker had reported 125 cases of ruptured tubal pregnancy he had seen. He had observed eight since, and six of the 125 cases were rapidly fatal hemorrhages. The one hundred and nineteen cases were instances in which rupture had taken place or there had been tubal abortion, hemorrhage having ceased, and some had gone along from one to two or three weeks after rupture, and two had gone, respectively, five or six months after rupture with constantly recurring hemorrhages. He had also seen six cases of undoubted tubal rupture or tubal abortion, with a small amount of hemorrhage. He waited to see what the result would be, and these six patients got well without operation. Therefore, these cases showed what Dr. Bonifield and Dr. Goldspohn had pointed out, namely, there was a certain proportion of cases of tubal abortion where the amount of hemorrhage was slight, would cease spontaneously and the patient eventually get well without operation. He had operated on three women, with an undoubted history of tubal pregnancy who, five or six years before, had masses in their pelvis, and in whom he found fetal remains two or three months after rupture, these patients eventually dying and leaving a lithopedion in the pelvis. He had never seen such a case go to term or approach it. He had seen two cases that went to five or six months with constantly recurring hemorrhages, but in both of these the abdomens of the women were nearly so large as those of women at term with succeeding hemorrhages. Both patients recovered. He had seen six cases that would have terminated fatally, as they were exsanguinated, if operation had not been done. Three of them were operated on as soon as seen, and all of them died within twenty-four hours from the time of rupture. In each case the abdomen was full of blood. He recalled one case he saw eight hours after rupture. The woman was very pale and anemic, the belly full of blood, sighing respiration, pulse 140 to 150, small and flickering. There was a low hemoglobin index. Patient had to be given stimulants. This patient was saved by operation. The next two cases he saw and operated on promptly were saved. He was convinced that in cases of rapid hemorrhage,

where the patients did not show any signs of rallying, and showed symptoms of continued hemorrhage some would die if left alone while others would get well following operation.

DR. HENRY SCHWARZ, of St. Louis, called attention to some points which he thought he might have possibly misunderstood. From the paper of Dr. Werder, it would appear as though tubal pregnancy would rarely go to term. While that was doubtless true, two of his (Werder's) cases were instances of primary rupture that went, after the rupture, near to term; yet it was a matter of record that tubal cases went to term as there were plenty of them on record. The speaker himself operated on a case February 22, 1896. This woman should have been confined in December, 1895. Fetal life continued until the middle of January. He saw the case on the 20th of February, and operated on Washington's birthday. The sac was removed in its entirety and then opened, disclosing a mature macerated fetus, above the average in weight. The sac was examined and found to contain muscular fibers everywhere, and it was a clear case of tubal pregnancy that had gone to term without any evidence of rupture.

PRESIDENT ZINKE asked whether there were any adhesions in the case.

DR. SCHWARZ replied that he did not remember. He cut out the sac completely, and the woman made an uneventful recovery.

Another point on which he differed slightly with Dr. Werder was this: he could not conceive of any case of tubal pregnancy which had not ruptured where we had a right to wait a day for the baby's sake, unless the woman was in a hospital under observation, where the surgeon could interfere at any moment. In all other cases one had better stick to the rule that any ectopic gestation which had not ruptured should be looked upon as a malignant tumor, and the sooner it was removed, the better. Of course, when ectopic gestation had ruptured, our attitude toward those cases would vary.

As regards the control of hemorrhage, in which the essayist had been so fortunate, he had a case in 1902 of a woman who had clearly a ruptured tubal pregnancy in the third month. She had all the signs of pelvic peritonitis following it. She was ill for several months afterward, and when he saw her she was twenty-six weeks pregnant. The fetal heart-beat could be clearly heard in the left hypochondriac region. He operated on her, an in trying to make an incision in the median line before he reached the peritoneum there was almost uncontrollable hemorrhage. The placenta was flatly implanted in the parietal peritoneum, the tube gradually rarefied and disappeared, so that she had a very severe hemorrhage before he could get into the abdomen. The baby lay in the amniotic membrane, with very little amniotic fluid, and could be easily extracted, but the time lost in securing the ovarian and uterine vessels was so great that when the woman got off the table she did not live much longer but died before he left the hospital.

With regard to Dr. Hayd's paper, he (Hayd) in his argument

spoke of cases in which the fetus continued to grow on account of the new attachment it made. This was a bit of heresy observed in text-books about ectopic gestation. The great bulk of cases any one ever saw were instances of either primary tubal or cases of tubal pregnancy that had ruptured, and where development went on because the placenta remained attached to the tube of its original site. The books informed us and practitioners maintained that so-called cases of abdominal pregnancy in which there was no attachment between the ovum and the pelvic organs, and cases of ovarian pregnancy, might be cases where early tubal abortion had taken place, and the aborted ovum had become reattached. Personally, he would refuse to accept such a proposition, for the reason that the cases were very rare. Those cases that he knew of showed no history of a previous rupture. It was more reasonable to think that these were cases of ectopic gestation that were not tubal, or tubal cases with primary rupture. These cases should have originally attached themselves to the site in which they were found.

He likewise differed with Dr. Hayd in his statement that hematoma of the broad ligament was difficult to diagnosticate. They were exceedingly rare, it was true, but it would be very unfortunate if a woman who had a tubal pregnancy should have it rupture in one of the several spaces into the broad ligament, unfolding the broad ligament and filling the cellular tissue on one side, making a tumor which was self-limited. If such a woman were subjected to a laparotomy it would be because the diagnosis was difficult. But the diagnosis in reality was easy. In these cases there was found a bulging tumor situated low down in the vagina. This was not found in any case of ruptured tubal pregnancy. In this one was confirmed when he examined bimanually. There was a tumor very much like a cellulitic abscess, low down, which could be easily made out. Dr. Schwarz related a case in point.

DR. A. B. MILLER, of Syracuse, New York, thought the subject under discussion should be dealt with from the standpoint of individual experience, as inflammatory conditions of the pelvis, and particularly ectopic pregnancy, had been extensively discussed from year to year, and it appeared the members went away with no greater conviction as to how to deal with cases of ectopic pregnancy than when they came. He had operated on over one hundred cases, with a mortality of three per cent., and of these three one was complicated by an umbilical hernia of long standing which became strangulated; a second was complicated by streptococic infection in the opposite tube, and a third was in extremis from hemorrhage.

A point which he desired to make regarding this condition was that the time to defer operation could not be decided on, nor could anyone lay down any law for the guidance of the ordinary man as to when to operate on cases as he came in contact with them. Personally, he had come to look upon this subject as almost sidewalk surgery, and contended that the sooner

a surgeon entered the abdominal cavity in a case of ruptured ectopic pregnancy, the more certain he was of saving life. Some of the patients who had died without operation would doubtless have been saved if operated on promptly.

DR. WALTER B. CHASE, of Brooklyn, said that evolution was going on in regard to the subject under discussion. He did not believe there was a member present who five or eight years ago would have gone so far as to maintain that it was safe to wait in every case of ectopic pregnancy where hemorrhage was present. But changes were going on and the experience of Dr. Frederick was pertinent in this connection. When Dr. Frederick and others had pointed out that in cases of ruptured ectopic pregnancy only five or six per cent. perished, he thought those who had been advocating and practising that the first duty when a diagnosis of ectopic pregnancy was made in which there was evidence of hemorrhage, was to operate, would not be in such haste. On the other hand, one was confronted with the fact mentioned by Dr. Miller that in certain cases the patients died, and here was the difficulty in the experience of the speaker, and he presumed it would be confirmed by many others, namely, that the first question was an absolutely correct diagnosis. If it were possible to get statistics which were unprejudiced by different observers who were competent to make observations as to the number of cases they had operated on in which rupture had taken place or not, we would have some further light on the subject, and it was along that line we were going to get light. It might take more courage to sit by and see a woman bleed to death than to operate, but if there were many of these cases that did not die, we should not be as precipitate in the future as many of us had been in the past. Every case must be made a rule unto itself. In most cases he thought one could determine whether hemorrhage had taken place or not. In those cases where the attack was sudden, the shock pronounced, one was justified in undertaking early operation.

Dr. MILES F. PORTER, of Fort Wayne, Indiana, said that if a surgeon were called to see a man or woman with a history that she had received a stab-wound in the neck and was permitted to examine it and knew from the symptoms she was bleeding to death he would do what surgery would call for—namely, tie the bleeding vessel. And this was the thing to do in cases of ectopic pregnancy in the presence of hemorrhage. If one could tell when the hemorrhage had stopped he could wait. But where was the man that could tell without running the risk of losing the life of the woman while he was waiting?

Another thing: Why should one want to wait where a tubal abortion had formed itself into an encysted hematocele? One had cause enough to open a woman's belly in the pathology prior to and which was the cause of the abortion. She had a diseased tube and the abdomen should be opened on that account. In some of these cases there was ruptured pregnancy in a bicornuate uterus and every one of these patients would die if the

hemorrhage was not stopped in a hurry. And who could tell whether there was a bicornuate uterus or not if he had not examined the woman and if the hemorrhage had stopped? To sit by to see whether a patient was going to stop bleeding or not did not seem to him to be either good logic or good surgery; and to inject into a woman's veins fluid under these circumstances was to do worse than to do nothing. No man had any business to introduce into a woman's or man's veins fluid which would increase tension while she or he still remained with an open vessel.

With reference to an absolute diagnosis, the man who waited for it in abdominal surgery, as well as in many other kinds of surgery, was going to bury many patients before he reached an accurate diagnosis. Personally he preferred to be saved rather than buried on a correct diagnosis. He thought most patients would prefer the same thing. The only ectopic patient he ever saw die bled to death while a practitioner sat at the side of the bed hoping and praying that the patient would recover, both of them equally good remedial measures he believed.

DR. THOMAS B. NOBLE, of Indianapolis, Indiana, agreed with Dr. Porter that we should continue to preach the doctrine of tying a bleeding vessel if we wished to save the lives of patients. We should do this for several reasons: (1) it was right; (2) if one waited he was not doing so to avoid a laparotomy, but with the belief that he was going to get the woman through without her having to undergo a difficult surgical procedure. A third reason was this: a hematoma was formed and changes occurred. Changes would be observed in the peritoneum. He did not know of anything which would change the peritoneal coat more quickly and more completely than the presence of a blood-clot, and if this were left one would have what occurred in Dr. Hayd's case—namely, pathological conditions would arise therefrom, and sequentially a laparotomy for adhesions, and possibly intestinal obstruction. Personally, he had never yet been able to tell whether bleeding had stopped in these cases or not. He had never seen just such a case as had been reported where there was a little split-pea opening at the horn of the uterus, filling the abdomen full of blood, and pain nowhere except in the right nipple. He was a firm believer in the doctrine, and preached the philosophy, of immediate operation in these cases for the further reason that if the information went out from this association that these cases were to be treated by procrastination until the diagnosis was correctly made, the patient would be tinkered with by the general practitioner until the specialist was finally called in to sign the death certificate.

DR. JOHN A. LYONS, of Chicago, asked if in case of collapse, exsanguination, pulselessness, almost complete hear failure, one should operate? Would it not be better to give salt solution, nitroglycerin, put hot-water bottles around the patient, and follow this up with strychnine until the patient was gotten in

such a condition that operation could be undertaken? He would like to hear what Dr. Bonifield had to say on that point.

DR. FREDERICK BLUME, of Pittsburg, said there was not a member present who did not know that a man or woman was safer when a bleeding vessel was tied. To say that every case of ruptured ectopic gestation should be operated on at once was certainly taking an extreme view. The principal point for discussion in his judgment was to determine which cases should be operated on and which should be left alone. It was very essential to individualize. There was no question but that a great many, if not most, of these patients did well after they got over the shock. Not long ago a patient was sent to him for operation and in two or three hours thereafter died. If this woman had not been operated on, and had received attention in the way of salt solution and intravenous injections, which could be done at the house, he thought she might be alive to-day. One must be governed very largely by the nature of the case and the condition of the patient.

DR. FRANCIS REDER, of St. Louis, said the crucial point concerning the papers read seemed to be about hemorrhage. Whenever a diagnosis of ectopic gestation was made before shock had occurred—and this could be determined by the pulse—he did not delay operation because he felt it was his duty to operate. On the other hand, if a patient were in shock, he would feel that it was his duty to try to arrest the hemorrhage, and if there were signs of a very feeble pulse he would reenforce his measures by intravenous injections, and while doing this he would likewise get his instruments ready for a laparotomy.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, said a good deal depended on proper classification of the cases. Cases of ectopic pregnancy were similar to those of appendicitis as regards classification, in that some of them needed to be operated on early, while others were operated on late. Outside of that, all classifications were usually made after the abdomen was opened. We could talk about classification and operate on the basis of it, but we could not make a proper classification in these cases until the abdomen was open. The man who in operating spent considerable time in the abdomen in order to cover over raw surfaces of peritoneum, to fix up the other tube, to suspend the uterus, to bring the sigmoid down over the raw surface, to fix the bladder, to look at the appendix, to investigate the gall-bladder, to find out the condition of the stomach, etc., was not the one usually who operated at once. His personal experience was such that he waited a while. After all, it was largely a matter of personal experience. In a case of ruptured ectopic gestation occurring, for instance, in a member of his own family, he would not want the man who would sit by the bedside and attempt to classify the case he had to deal with, but would select the man with his instruments ready to operate as quick as the Lord would let him.

DR. CHARLES GREENE CUMSTON, of Boston, had seen a number of cases of intestinal obstruction in which a history had been given of previous intraabdominal hemorrhage, not always from extrauterine pregnancy, but from a perforating duodenal ulcer. In his early professional career, it happened to him on one occasion to explore a ruptured extrauterine pregnancy by the vagina. He cleaned out the clot, and in twelve hours or less he was again at the hospital taking out the tube through the abdomen, because cleaning out the clot from below started the hemorrhage again.

DR. WERDER (closing) said that inasmuch as there was very little discussion on his paper, he would simply confine himself to the remarks made by Dr. Schwarz as to the rarity of cases of ectopic gestation going to term. Dr. Schwarz evidently had misunderstood him, for he (Schwarz) had said these cases were comparatively rare. However, Sitner had collected 570 cases of advanced ectopic gestation, showing they were not so extremely rare.

As to whether it was justifiable to keep the mother waiting in order to try and save the child, he pointed out distinctly in his paper that it would only be justifiable, where the mother could be kept under observation and where there were no complications.

DR. HAYD, in closing, said that those who had spoken in favor of delay were going to take more chances by waiting than he was in operating promptly.

So far as the diagnosis of hematoma and hematocele was concerned—and he used the word hematoma in the sense of a hemorrhage into the cellular tissue, or between the planes of muscles, and hematocele a hemorrhage into some cavity—it was easy to make such a diagnosis of small hematoma of the broad ligament. If it were a large hematoma filling up the whole pelvis or culdesac, some difficulty would be encountered in making the diagnosis.

DR. BONIFIELD, in closing, said that when he read his paper he fully expected to incite some fervid oratory, but unfortunately fervid oratory did not prove very much, and, as Dr. Miller had pointed out, he was afraid most of the members would go away with the same opinions they had when they came, because they were based more or less on personal experience. Several of the speakers had said that one could not tell whether hemorrhage had ceased or not. He admitted they could not if they never tried. Those who were so cock-sure that the only thing to do was to operate as soon as they saw the patient would never find out whether hemorrhage had stopped or not. He insisted that if a man viewed these cases in a judicial manner, as Dr. Werder did, in a large percentage of cases he would be able to make a fairly accurate observation and arrive at a fairly accurate conclusion as to whether hemorrhage had ceased or not, and the members, if they would read the paper carefully when printed, would find that he had advised waiting in every case, but in one

case he operated at once. He had operated on a number of others immediately. He simply quoted typical examples, and unfortunately had not an accurate history of all his cases.

ACUTE PANCREATITIS.¹

BY

LOUIS FRANK, M. D.,

Louisville, Ky.

Professor of Abdominal Surgery and Gynecology in the Medical Department of
Kentucky University

THE pancreas, notwithstanding the development of a most highly perfected technic in abdominal work, seems to have been the last organ in this cavity the diseases of which have come under the care of the surgeon for treatment; in fact, the problems in connection with the pancreas, both physiological and pathological, have yet to be worked out in their completeness. We are as yet ignorant of the precise physiological functions which the pancreas performs in the human economy. It is certain that there is an excretion which has much to do with digestion; it is equally certain that there is a secretion which, taken into the blood, has to do with tissue metabolism. That the cells composing the so-called islands of Langerhans have to do with this latter function seems to be assured, but the sum total of disturbed function resulting from lesions of the pancreas and the effect therefrom upon the general economy, there being of necessity manifestations connected with excretion and with secretion, we do not exactly know. So, also, with regard to the etiological factors which produce disease of the organ, there is still much to be learned.

From a study of the text-books upon surgery it would seem that, aside from injuries and cysts, with occasional carcinomas in this organ, there are no lesions worthy of surgical note. The memorable work of Fitz, in 1889, gave an impetus to the investigation of pancreatic diseases which is just now reaching its culmination. The reported lesions were very few until within the last few years. This fact is emphasized very strikingly by the work of Boldt in the early eighties, when he was able to collect only 140 cases of diseases of the pancreas, among which there were eleven cases of pancreatitis. We find that Korte, in 1898, was able to collect only 144 cases of inflammation of the pancreas as included in the varieties mentioned by Fitz. Studies of live pathology in connection with gall-bladder disease, as exemplified in the work of Robson, Mayo and others, show that

¹ Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

certain affections of the pancreas are far more common than we have been led to believe and have opened a way for the treatment of a particular class of diabetics which had heretofore been grouped with the incurables.

With these, however, I am not concerned in this paper, except to say that chronic lesions of the pancreas are more amenable to surgical treatment than are the acute, that they can possibly be more definitely recognized and that not only can the local pathology be abated, but the general symptoms, due to disturbance in the secretory function, can be done away with. This is not difficult to understand if we bear in mind the anatomic factors concerned in the production of this pathology; in fact, it is quite reasonably certain that the anatomic relationship of the secretory ducts of the biliary tract to the head of the pancreas and to the main pancreatic duct, has largely to do with, not only the etiology of chronic lesions, but practically most acute ones. And, conversely, it is asserted by Robson that this relationship is responsible for some biliary manifestations. This, my own experience, has been too limited and my observations too few in this connection, to either affirm or deny. Its importance, however, is very great, as it means the opening up of wider fields into which we may soon enter with almost certainty as to the result to be attained in a given symptom-complex.

Of acute inflammation Fitz has designated three varieties—hemorrhagic, suppurative and gangrenous. That these are primarily true inflammations, microorganismal in origin, I do not believe. We do have bacterial invasion, but it is exceedingly rare that primary microorganismal infection is the cause of the so-called acute inflammations. For this reason we do not have in other organs an analogy to the so-called pancreatic inflammations.

To me the causative factor seems to lie largely in the retro-injection theory of Korte, Halstead and Flexner, notwithstanding the reports of patent diverticula of Vater, the absence of obstruction and the few isolated cases of acute pancreatitis in which the duct of Wirsung opens into the bowel at a separate and distinct point from the common duct. These are among the problems and phases of pancreatic disease which have yet to be more completely and thoroughly elucidated. My own experience has been confined to acute cases and in each case there could be no question as to the disease being secondary to biliary pathology.

Stockton and Williams, in a recent article, place the causes of acute pancreatitis under six headings:

1. Traumatism.
2. Gall-stones.
3. Infection (which seems to be given high rank by Robson and Cammidge in their recent work).
4. Causes inherent in the pancreas itself due to some perverted action of its ferments.
5. Gastroduodenal catarrh (which they think operates indirectly).
6. Arteriosclerosis, embolism and thrombosis.

If we analyze these causes we can, except in the few instances where there may have been trauma or a duodenal ulcer or arteriosclerosis, class the other causes among those of disturbance of perverted action of the pancreatic ferments induced in all probability by some chemical irritant, most likely retroinjected bile. The other causes are those which may precede an infection in any other organ and it must be admitted that, in so far as this is true, the pancreas may partake of lesions and of inflammation the counterpart of those to which other structures are liable. With acute infection comes the ferment disturbances and autodigestion and fat-splitting action peculiar thereto. A careful study of the literature shows gall-stones as the common accompaniment of pancreatitis, both acute and chronic. All investigators have remarked the association of these two conditions, so that there can be no doubt, I think, of the relationship between them.

Aside from the local pathology in the gland itself, the most striking changes occur in the subperitoneal fat tissue in the form of what Basler has described as fat necrosis. Langerhans has shown that the most essential changes in so-called fat necrosis are in the cells themselves, and are due to a splitting up of the fat molecule into fatty acids and its soluble constituent, glycerin. The latter is absorbed and the acid deposited as needle crystals in the necrotic cell, which loses its nucleus. These fatty acids unite with calcium which may be demonstrated by microchemical reaction within the cell outline.

Just as jaundice is the index of obstruction to the hepatic outflow, so does fat necrosis indicate obstruction of the pancreatic duct. Unfortunately, this fat necrosis cannot be noted until the abdomen is opened and, frequently, much valuable time has been lost before this point is reached.

That diagnosis is quite difficult before operation we are aware.

The symptoms are those of acute septic peritonitis of the upper abdomen; in fact, I have known one patient operated on for intestinal obstruction peritonitis, with ensuing death, the cause, acute pancreatitis, being recognized only postmortem. Fitz's rule is worth bearing in mind, that acute pancreatitis is to be suspected when a previously healthy person or a sufferer from occasional attacks of indigestion, is suddenly seized with violent pain in the epigastrium, followed by vomiting and collapse and, in the course of twenty-four hours, by circumscribed swelling, tympanitic or resistant, with slight rise in temperature.

In my own cases the acute upper abdomen peritonitis symptom were highly exaggerated. Pain was the predominant symptom, though Halstead has reported a case in which the patient was up walking about before the operation. There is usually a history of pre-existing digestive disturbance or of colic, or of recognized cholelithiasis, possibly with slight jaundice. In arriving at a diagnosis, this preceding history should not be ignored; in fact, I would deem the history of equal or even more importance than the mere physical examination of the patient.

The pain is violent, sudden and of a pronounced type. It has been described as more frightful than of gall-stones; in fact, absolutely intolerable. It is usually felt primarily in the epigastric region; later over the abdomen generally. Vomiting may or may not accompany it. If it does, it may become frequent, regurgitant and of feculent odor, but never stercoraceous in character. Probably it is this odor which has led to the diagnosis of intestinal obstruction in some cases, and this error in diagnosis is more easily understood, as constipation is marked and may even be absolute. Constipation is a very conspicuous symptom. Tenderness in the epigastric region begins with the very onset of the trouble. Collapse is profound. Death may ensue within an hour or two after the onset of symptoms. Again, this latter symptom (collapse) may not appear until a day or two has passed. The shock is not due to hemorrhage, for this, as a rule, is not great, but is probably brought on by some interference with the sympathetic and by vasomotor paralysis. Occasionally there may be no shock at all.

The pulse and temperature are usually increased and there may be chills preceding the onset. Tympany is present and may at times be very great. Jaundice may be present at the start; as a rule, however, it does not come on until a day or two after the onset of the acute symptoms. In fulminating cases a tumor will

rarely be detected, though there is marked epigastric resistance and, if the patient lives two or three days, a swelling will be noticed and, in suppurative cases, a tumor may be made out. The stools may show fat or oil droplets. The finding of undigested muscle fiber is positive evidence of the absence of pancreatic juice. Melæna is occasionally present but, in acute cases, little can be ascertained by the study of the stool on account of the constipation.

My observation, from the three cases I have had opportunity of seeing, is that they gave no symptoms of value in connection with urinary analysis, and I was not able to get the so-called Cammidge reaction which has been described by Robson and Cammidge as so characteristic of pancreatic disease. Neither could the presence of sugar be detected in the urine, and I believe that, in acute cases, the urinary symptoms will rarely be of any value.

After several days, with the appearance of swelling, jaundice and other evidences, the diagnosis should not be of such great difficulty, but at this time the opportunity for beneficial surgical interference has probably passed.

I would attach the greatest importance to the character and location of the pain, and the impression it produced upon the patient in conjunction with the previous history and the absence of positive symptoms pointing to other disease, as most likely evidence of the onset of acute pancreatitis, though a positive diagnosis cannot be made until the abdomen has been opened.

Early operation and drainage offers the greatest hope of relief, and even with this the outlook in most cases of acute lesions must still be bad. The pancreatic excretion must be drained and if this cannot be secured by rapidly clearing out the biliary tract and draining back through its ducts and the gall-bladder, it should be effected transperitoneally through the gastrocolic omentum directly from the broken-down pancreas. Any other plan of treatment is utterly futile and the sublime helplessness thereof will be shown by a mortality of 100 per cent. To be at all effective, not only must diagnosis be made early, but surgical interference must be prompt and drainage must be complete. My own experience is limited to three cases which I will relate.

CASE I.—Alice H., white, age twenty-five, married, housewife, mother of four children; admitted to the hospital, April 27, 1907. Had been in failing health for nearly a year. About six months previously she had been seized with griping pains in the upper

abdomen, with some vomiting and constipation. Diagnosis of gall-stone colic was made, which was relieved by medicinal treatment. Since that time the patient has been able to attend to her household duties, but has never been entirely well, having gradually lost flesh.

On April 26, she was suddenly seized with deep-seated violent and colicky pains in the upper abdomen, soon followed by nausea and persistent vomiting, constipation, abdominal distention and meteorism. When admitted to the hospital on the following day the above symptoms were all present, with tenderness and rigidity of the upper abdomen, very slight distention, skin cold and clammy, beginning jaundice, subnormal temperature, pulse 90, respiration 36. Urinalysis showed a large quantity of bile; otherwise normal. Marked leukocytosis. Diagnosis, acute choledochus obstruction, with cholecystitis and stone was made. Two high enemata were given with no results. Following a third one, a black, offensive fluid, containing hard white scybala, was passed. On April 28, abdominal distention was increased, vomiting still persistent (brownish, offensive fluid); jaundice markedly increased, temperature 97, pulse 140, respiration 60. On the morning of April 29 the patient showed some improvement.

The abdomen was then opened, incision being made in the right rectus beginning at the rib margin. The first thing noticed was extensive fat necrosis of omentum, mesentery and subperitoneal fat. The gall-bladder was enormously distended, enlarged and dark, densely adherent, and on opening it a dark, tarry bile flowed out. The adhesions were separated and when the bile tract was freed a necrotic area in the gut involving the surrounding tissue was noted and there was an escape of serum, stained and odorous in character from the renal fossa. By this time the patient was doing so badly that no attempt was made to go any further. A drainage-tube was put into the gall-bladder and another down to the necrotic area, where a cofferdam drain was placed and the incision closed. Death occurred within five hours.

The autopsy revealed those yellow-white patches, denominated fat necrosis, in the omentum mesentery and subperitoneal fat. From the gall-bladder some ten cholesterol stones, varying in size from a pin to a pea, were removed. The common duct was large and the diverticulum of Vater dilated. The liver was diminished in size while the pancreas was more than twice the normal size and showed evidence of marked inflamma-

tion with necrotic areas of small size. A hole was found in the duodenum just below the pylorus where it was in proximity to the gall-bladder when the latter was distended.

CASE II.—Mr. V. B., age forty-nine, presented at my office in shock, suffering great agony on account of excruciating pain in the abdomen. He gave a history of several attacks of pain upon previous occasions, with cramp in stomach. The last of these attacks occurred about two weeks ago. He has never had jaundice, but has been a more or less constant sufferer from indigestion. About nine o'clock on March 28, 1908, while shopping, he was seized with intense pain in the epigastric region. He was given some morphia for the relief of this pain without any effect, and a little later secured another dose of morphia. I saw him about twelve o'clock, in shock, extremities cold, nails blue, pulse thin, thready and very rapid. The epigastric region was tender to the touch. The pain was described as keen, cutting and extending to the back. The abdomen was flat. There was no tympany. Liver dullness present; no vomiting, though great nausea. At first he was thought to have a perforated ulcer of the stomach. He was sent to the infirmary, put to bed and closely watched for twenty-four hours. On the 29th, he began to show some jaundice, with excruciating pain still present in the epigastric region, some vomiting and beginning distention. Marked depression and symptoms of shock were still present. His temperature when sent to the infirmary was $102\frac{4}{5}$; pulse 120; respiration 26. Leukocytosis, 34,600, Urinalysis shows albumin, bile, sp. gr. 1020, otherwise negative. The following morning his temperature was $96\frac{4}{5}$; pulse 112; respiration 38.

Immediate operation was advised with diagnosis of probable obstructing stone. At the operation, which was at once proceeded with, there was found a small stone in the common duct; no stones in the gall-bladder. The head of the pancreas was markedly enlarged. The gall-bladder was opened and drained; the common duct incised and the stone removed. The common duct was drained by tube and gauze wick and the patient put to bed in very bad shape. He did very well for a few days, then his wound began to open, fat necrosis showing in subperitoneal fat. Pus of a dirty-brownish character presented itself. Death ensued ten days after the operation, the skin about the incision being eroded, the wound wide open. No autopsy was permitted.

Whether or not this patient had a dilated diverticulum of Vater, I do not know. A stone was present in the common duct

at the point where the duct empties into the duodenum; in fact, the stone was not within the diverticulum, the common duct passing through the head of the pancreas, and being of that type in which the presence of a stone might easily obstruct, by pressure, the duct of Wirsung and thus occlude it.

CASE III was seen June, 1908. He gave a history of digestive disturbance extending over a number of years; had been a drinker, though in the last year or two he had not used alcohol to excess. The onset of the disease was sudden and marked by excruciating pain in the epigastric region. This pain radiated into the back and into the side. There was marked tenderness upon pressure, vomiting, profound shock and obstinate constipation. Diagnosis of gall-stone obstruction had been made by his physician. His temperature was 102; pulse 130. When I saw him the abdomen was distended and tender. At the middle line, about three inches below the sternal tip, was a tumor, symmetrical and extending on either side to approximately the mammary line. This tumor was hard, tympanitic on percussion, tender and painful. It formed a distinct prominence, separated from the margin of the ribs. There was a slight icteric tinge to the conjunctiva and the urine contained bile.

Immediate operation was advised and carried out with a median incision, five inches in length, over the tumor. The subperitoneal fat and the omentum were studded with areas of fat necrosis. There was bloody serum within the abdominal cavity. The intestinal coils were agglutinated and the stomach adherent, as also the upper duodenum and omentum. The gall-bladder was small and contained no stones, but a stone was present in the common duct, occupying the duodenal portion. The condition of the patient was so bad on the table that no attempt was made to remove the stone. The gall-bladder was drained. The tumor in the epigastric region was opened through the gastrocolic omentum, and from it some bloody, purulent débris evacuated. A tube-and-gauze drain was put into this cavity, which was clearly in the pancreas, and the incision partly closed. Five days later the gauze drain was removed, the bowels having begun acting and the patient taking nourishment. A week after the operation he had lost twenty pounds in weight, the skin incision and the skin about it were irritated and the line of union beginning to separate. From the tube which remained present in the cavity, aspirated fluid showed the reaction of pancreatic fluid. Belly soft, pulse 114, temperature 100° F. The mass in the epigastric

region had entirely subsided. Two weeks after the operation this patient died, the wound having opened up throughout its entire length and the margins of the skin about it being greatly eroded, probably by the action of the pancreatic juice which came in contact with it.

The urine, taken the day after the operation, showed the following: color, reddish yellow, turbid; sp. gr., 1015; reaction, acid; bile, a trace; albumin present; hyaline, granular and amyloid casts; Cammidge reaction negative; no sugar. The stools showed no fat nor blood nor muscle fiber.

THE ATHERTON.

DISCUSSION.

DR. THOMAS B. NOBLE, of Indianapolis, said that acute pancreatitis, or pancreatitis of any character, as observed clinically, was further evidence for the necessity of early intervention in gallstone surgery, for the reason that it so frequently followed some antecedent biliary pathology. He had had experience in three cases, two of which were hemorrhagic, the other acute interstitial. All of them were attended with an antecedent biliary disease.

The first was a large hemorrhagic cyst due to hemorrhagic pancreatitis. The cyst was evacuated, and the patient died eight days later of acute mania.

The second case was attended with empyema of the gall-bladder, with the presence of gall-stones and infection therefrom, presenting the interesting characters of a widespread fat necrosis. This woman made a good recovery but complained of the symptoms of the disease given by the essayist. There was pain, particularly in the epigastrium, with vomiting. The symptoms lasted for six days following operation.

The third was a large hemorrhagic cyst in a physician. The condition had been diagnosed as malignant disease, and he had given himself up to die. This condition continued for three or four months, and at the time he was seen by the speaker was extreme. The patient could not tolerate a general anesthetic, and so under local anesthesia his abdomen was opened, and a gallon of thick, viscid, tarry fluid removed from the pancreatic region. The symptoms immediately improved. The patient did well for a week, when another hemorrhage occurred, and following this another. These hemorrhages recurred until he bled to death.

In the management of these hemorrhagic cases he thought the incision should be sufficiently large to resort to packing, if necessary, for the control of a possible secondary hemorrhage that might occur from the destructive changes that the pancreatic juice had upon the bloodvessels.

DR. WALTER C. G. KIRCHNER, of St. Louis, was greatly

interested in the subject, saying it was very much neglected. Not enough attention had been given to affections of this organ. From his experience he was convinced that affections of this organ occurred oftener than they were recognized. The acute symptoms differed pronouncedly from the chronic, and the treatment of the chronic condition was therefore entirely different from that of the acute.

He had had occasion to see some three or four cases of the acute form, all of the patients dying in a few days.

One was an acute infection of the pancreas, with suppurative changes, resulting in fat necrosis. The other was the gangrenous form, and a third case, which he saw a short time ago, was one that gave a history of gastric hemorrhage. The patient had had several of these hemorrhages, not thinking they were serious. He was taken suddenly sick on the street at two o'clock in the afternoon, and at about three o'clock, when brought to the hospital, he was in collapse, and in a few hours died. Autopsy revealed a perforative duodenal ulcer, the perforation taking place in the head of the pancreas.

These conditions were of such acute nature and so urgent that prompt surgical intervention was necessary. The patients were in a profound state of collapse, and often it was difficult to explain the condition, the pancreas usually escaping attention. In all of these cases, as the essayist had pointed out, early operation should be done even if it was for exploratory purposes.

DR. MILES F. PORTER asked whether hemorrhage occurred from the gastroduodenal ulcer.

DR. KIRCHNER replied that it was the result of the affection of the pancreas.

DR. FRANK, in closing, said that he had reported one other case an account of which he did not read. The first case was diagnosed as one of cholelithiasis, and at the operation no stones were found in the gall-bladder. Another case was recognized at once from the condition of fat necrosis as one of acute pancreatitis. Drainage was instituted in the gall-bladder, and also in the area about the head of the pancreas, but no stones were found. Patient died two hours after operation. Autopsy revealed a large erosion in the duodenum which must have resulted from the pancreatic juice. The common duct was eroded at the point of juncture with the duodenum. Six small stones had escaped into this cavity. In each of the other two cases stones were found. One of these was not diagnosed as pancreatitis until operation, while the other was diagnosed before the operation was done, and one stone found, not in the intraduodenal portion, but back of it a little, the duct passing through the head of the pancreas. The other case was drained through the pancreas directly. Only one stone was found. Two of these cases occurred in men. The other case was diagnosed and at the operation a stone was found in the common duct in the duodenal portion. The common duct was drained at this point; the gall-bladder also drained, and the pancreas was

drained between the colon and the stomach, drainage being established transperitoneally at this point. The man lived two weeks. The second patient also lived two weeks, the incision opening wide before his death, and the area about the incision being very markedly eroded.

First Day, Evening Session.

ABSCCESS OF GAERTNER'S CANAL.¹

BY

MAGNUS A. TATE, M. D.,
Cincinnati, O.

AN abscess of Gärtner's canal is such a rarity that it might almost be classified as a pathological curiosity.

So few cases have been recorded, the paucity of literature being so marked, one is strongly tempted to question the diagnosis of an abscess of Gärtner's canal.

Embryologically Gärtner's duct presents many unique stages, and the tracing of its various steps of development is interesting. The urogenital system has its beginning in the mesoderm. At a point in the mesoderm or mesoblast, where it separates into the splanchnopleura and the somatopleura there is a massing together of cells forming a ridge, known as the Wolffian ridge. This Wolffian ridge is seen to extend from just below the heart to the posterior extremity of the body-cavity. About the eighteenth day the Wolffian ridge is seen to contain a cavity, in other words it becomes hollowed out into a tube, when it becomes known as the Wolffian duct. Just anterior to the upper part of the Wolffian duct there extends a projection into the celum, in which there are developed two or more tubular cavities emptying into the upper part of the Wolffian duct, and known as the pronephric ducts. Around these little ducts glomeruli form and then they become known as the head kidneys, primary kidneys or pronephros. So we describe the pronephros as a series of transitory tubules connected with the celum and emptying their contents into the Wolffian duct. To the inner side and behind the Wolffian duct a series of little tubes develop, which take a transverse direction and communicate at one extremity with the Wolffian duct.

To these transverse tubules the name of mesonephros or Wolffian body is applied and they sometimes are designated as the midkidney. The Wolffian body appears about the eighteenth day, but does not become hollowed out into the tubes until

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists at Baltimore September 22-24 1908.

sometime during the fourth week. As the mesonephros develops, the pronephros begins to disappear. Here and there remnants of the pronephros remain as little pedunculated sacs, the stalked hydatid of Morgagni. It is only fair to state that there are some embryologists who say this little cystic vesicle is not developed as above described, but really comes from the anterior end of the duct of Müller.

The Wolffian body develops rapidly during the second month and is supposed to act as a functioning excretory organ, but its retrogression is equally rapid, upon development of the metanephros or permanent kidney.

The atrophied remains of these tubules as we all know can be easily demonstrated by holding up an excised broad ligament to the light. The upper part of tubules is known by names of the epoophoron, parovarium and organ of Rosenmüller, while the lower or distal part (frequently absent) is called the paroophron or the yellow body of Waldeyer.

These tubules vary in number and size and enter at right angles into the Wolffian duct.

This Wolffian duct becomes known as Gärtner's canal or duct, and much discussion has arisen as to its course, extent, permeability, termination and what significance its existence portends.

In Routh's summary, we find that Malphigi in 1681 first called attention to the greater frequency of these embryonic structures in the lower animals (as the cow) than in man, and Gärtner, in 1822, also investigated along this same line, and the Wolffian tube or duct called Gärtner's duct was named after him. Bland Sutton, in 1894, published his observations after examining some seventy cows and found persistent Gärtner's ducts.

He says that cysts may arise from Gärtner's ducts in the vagina; if so, they are usually small and contain a slightly watery mucoid material. Dilatation of the ureter sometimes appears in this locality and a suburethral abscess may simulate such a cyst. Dohrn says that kittens have persistent Gärtner's ducts along the vagina. Smith quotes R. Meyer who found Gärtner's duct as follows:

In feti 2 to 3 mo. in 12 cases, 12 times—100 per cent.

In feti 4 to 6 mo. in 21 cases, 6 times—28.5 per cent.

In feti 7 to 9 mo. in 67 cases, 11 times—16.4 per cent.

In the new-born in 18 cases, 3 times—16.3 per cent.

In uteri of adults in 54 cases, 12 times—22 per cent.

That Gärtner's duct may extend into the anterior lateral vaginal wall is now generally accepted.

Almost all of the observers who have been able to trace persistent Gärtner's ducts as far forward as the urethra, describe the opening as being just behind and to one side of the urethral orifice. It is also said to open into Skene's tubes, and to be the source of some cases of obscure albuminuria.

Shüller, Fishel, Dohrn and Rieder believe that Gärtner's ducts never persist as far forward as the urethra but to this statement most authorities disagree. Garrigues claims that in 80 per cent. of adult females these two small tubules open just posterior to the meatus urinarius. Kocks holds a similar view. Naegel says that Gärtner's duct extends as far as the vaginal portion of the cervix. Beizel and Dohrn have found it in the vagina. Ackerman says he has traced it down to the hymen. Klein has traced it in the newly born from the parovarium into the uterus down to the cervix.

Others have traced this duct into the body of uterus where it took an S-shape through the fornix and extended along the vagina. Beaudelocque traced the duct parallel to the uterine cavity to the internal os into which it opened. Also, branches of Gärtner's duct have been found to be given off into the uterine substance.

Two adult cases have been described by Lawson Tait, and Milton in which the ducts discharged their contents at the vestibule just below the urinary meatus. Skene describes a case in which Gärtner's duct emptied into the urethra. In Routh's summary we find that Gärtner's ducts may have diverticula just as the vesiculæ seminales are diverticula of the vasa efferentia. These diverticula are called Max Schüllers glands and are described as leading directly into Skene's ducts and Gärtner's duct as being continuous behind and parallel to Skene's ducts.

Gärtner's duct if patent may become distended at any part of its course, constituting a variety of parovarian cyst if the distention be in the broad ligament, or a vaginal cyst if it be in the vaginal portion. He (Routh) further calls attention to some of these cases as affording possible explanations of some obscure conditions of profuse watery discharge from the vagina not coming from the uterus or bladder.

I find in literature the following interesting cases which I briefly report. In the first two reported, one by Routh and

one by Kelly, a collection of pus was found in the lower part of the duct.

1. Kelly's case. The duct could be traced from close beside the cervix along the left lateral wall of the uterus to the vestibule on a level with the posterior wall of urethra. An opening occurred spontaneously, pus was discharged and this was followed by recovery.

2. Routh's case. The duct distended and contents finally suppurated. Patient 25, had attacks of bearing-down pains and coccygodynia. Improved rapidly under treatment for a while but in a few weeks her sufferings returned.

He lost sight of patient but in two and one-half years she consulted him again for intense pain over right ovarian region and for a profuse yellow watery discharge which occasionally became horribly offensive. The abdomen was somewhat distended. Examination revealed the vulva moist from a discharge while the upper part of vagina was almost dry. Uterus was found to be movable but pushed over to the left side by a somewhat elastic mass on the side of pelvis in the broad ligament.

An elastic ridge was found in the vagina from the base of the right broad ligament to a spot slightly to the side of the cervix. A fortnight later the patient complained of a throbbing pelvic pain and her temperature had risen to 102. The ridge in the vagina was much larger and contained fluid. Under ether the tumor was distinctly felt in the broad ligament. After an opening, offensive pus continued to come away for some days. Later the duct was thoroughly laid open and much pus escaped. The opening in the broad ligament was enlarged, thoroughly flushed out but the discharge continued for five weeks, and permanent recovery resulted. Along this line, Watt, in 1881, and Veit, in 1882, report cases associated with broad ligament and vaginal cyst.

3. Watt's patient had a vaginal cyst which bulged from the anterior wall in the position of a urethrocele.

After an incision a probe passed upward could be felt midway between the umbilicus and the left anterior spine of the ilium. He considered he had entered the abdominal cavity but it was probably between the layers of the broad ligament.

4. Veit's case was a cyst the size of a child's head protruded from the vagina. The cyst was incised and the finger could be passed up into the broad ligament and even feel the ovary.

5. Milton's case was an Egyptian woman, aged 30, who had a

constant watery vaginal discharge. Married at 13, became pregnant, delivered and a healthy child; discharge continued during the whole pregnancy. Vaginal examination disclosed a minute orifice admitting a catgut guide on the vesicovaginal septum, a little to the right of middle line and half an inch posteriorly to the vesical extremity of the urethra. From this issued drop by drop a pellucid fluid, two ounces per diem, specific gravity 1026, containing much albumin and some chloride of sodium. A urethral bougie followed the line of the ureter in the direction of the right kidney. Mr. Milton tucked the end of the canal into the bladder and closed the vesicovaginal septum. Patient left the hospital free from vaginal discharge but with an albuminuria.

To the number I add the following report. Dr. John Caldwell asked me to see this case with a history as follows: Patient 36 years of age, normal weight 135. Married fifteen years, had never been pregnant, and when further questioned said she had never been unwell. Had never had any discharge of a bloody character from the vagina and never had had any of the other symptoms which often accompany a menstrual discharge. For some years she has had a number of very peculiar attacks, never knowing what caused them nor has she ever had any satisfactory causative explanation. They begin with a pain in the pelvic region accompanied by rigors, this being followed by distinct chills, rapid pulse and high temperature. This condition would last from a few days to a week or two, then there would be a vaginal discharge of a little pus, which was always followed by a subsidence of symptoms, and an apparent recovery would ensue. Patient would then get up, go about her household duties and be free from another spell from six months to a year, when she would be attacked by a similar sickness.

When I saw her, she explained that this was the worst attack she had ever had. She was somewhat emaciated, only weighing about 100 pounds, was very feeble, her temperature ranging from 102 to 104, and pulse 120 to 130. Upon abdominal examination some tenderness over both right and left lower sides of pelvis was discovered; vaginal examination was very painful and the patient said there had been for a few days a slight watery flow mixed with a little pus. The vagina was very hot and exquisitely tender so an unsatisfactory examination was made and on opinion given as to the trouble or causation of the same.

The patient readily consented to go to the Good Samaritan Hospital. After complete anesthesia, assisted by Dr. Pirrung, a vaginal examination disclosed a small anteverted uterus but no tubes or ovaries could be palpated. On the right wall at a central point between the anterior and posterior vaginal walls was found a decided thickening, and on tracing it up, it felt like a ridge of massed tissue which passed up to the side of the cervix in the vaginal vault. Being still at a loss to account for symptoms I opened the posterior culdesac and on a careful palpation thought I detected a small fluctuant mass in the right broad ligament, but no ovaries or tubes were present, at least none could be detected by the examining finger. Packing some gauze in behind the uterus I then opened up this ridge of vaginal ligament as far as I could.

I thought best at this time to stop searching and make an abdominal section later if her condition would allow it, and I had gained her consent, if no improvement followed this unsatisfactory vaginal operation. The following day the little gauze which had been placed in the ridge tissue was bathed in pus which was constantly being discharged, the temperature subsided and patient made a recovery. For nine months her health has been excellent; never any pain or tenderness, no vaginal discharge, has regained her usual weight, in fact is normal except for the absence of menstrual flow. I present this case to the association with a diagnosis of an abscess of Gärtner's canal.

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THE PRESENT STATUS OF CESAREAN SECTION

WITH A REPORT OF FIVE CASES.¹

BY

CARLTON C. FREDERICK, B. S., M. D.,
Buffalo, N. Y.

I WISH herewith to report five cases of Cesarean section hitherto unreported by me, and at the same time review in a cursory way something of the present status of Cesarean section. Among obstetricians of note who have recently put into definite form the results of the profession's advanced experience in obstetric surgery are Hirst, Norris, Reynolds, Zinke, Williams, Davis, Frye and some others. The operation, in all its relations as a substitute for forceps and version, craniotomy and embryotomy, symphysiotomy or pubiotomy, cannot be discussed at this time, as it is too vast a subject.

The general practitioner throughout the land is the accoucheur preëminent. To him we must look for improvement from year to year in his aseptic technic, in his early recognition of abnormalities, in his improved conduct of the hygiene of the pregnant woman and in the improved conduct of delivery. Both maternal and fetal mortality should be lowered and can be. It is the crying need. Far too many children's lives are sacrificed by failure to recognize malpositions and failure to correct them early and by forcible, brutal and unscientific deliveries. Far too many women and their unborn children die from neglect of attention to the various toxemias of pregnancy in their incipiency. Far too many women develop puerperal sepsis, and when discovered the treatment is not modern nor effective. Every primipara and every multipara who gives a history of previous difficult labor should be carefully examined by her attending physician as early as possible in her pregnancy, with the object of determining all that can be determined as to her general condition, her nourishment and elimination, her probable conduct in labor and as to the presence of tumors, deformed or contracted pelvis or any other mechanical obstructions to delivery.

In this connection we have only to discuss the mechanical obstructions. Any practitioner of experience and observation can, by a pelvic examination, at once determine the existence of a

¹ Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

deformed or generally contracted pelvis, the presence of exostoses or other growths obstructing the pelvis. The measurements which are then made will decide approximately the degree of obstruction to delivery. The capacity of the pelvis can be determined largely by the general "feel" of roominess, whether the promontory of the sacrum is high, far above the examining finger; by the generally curved outlines of the pelvic walls and the ascending rami of the ischium and the descending rami of the pubic bones; by the deep curve of the sacrum; by the width, thickness and angle of inclination of the symphysis as well as the angle of inclination of the pelvic brim.

Norris says: ". . . Is it not time, in view of the modern results of Cesarean section, to formulate a general rule to which there will be 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, Cesarean section at or before the onset of labor, should be the elective operation." He further adds: "The merits of pubiotomy as an alternative operation are to be determined by future observation and study." 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 our decisions for or against Cesarean section.

But the pelvis which are just a little larger, say $8\frac{1}{2}$ or 9 cm., especially when the child's head is proportionately larger and we do not know it, thus keeping the relative disproportion between head and pelvis the same, are the ones which prove to be stumbling blocks and lead us into all sorts of difficulties. In that class of cases, when it is not determined absolutely by the pelvic measurements prior to labor that the only safe delivery shall be by the elective Cesarean section, and the patient is allowed to go into her labor, after a long and exhausting effort at delivery, possibly with repeated attempts at instrumental delivery, possibly with attempts at version, we are confronted with the questions, How to deliver? Which way promises most for both mother and child? Is the child living or possibly so injured that it probably will not survive? Is the mother so exhausted that she may or may not survive the ordeal of a Cesarean section? Or has the labor been conducted in a manner so septic that if she survives the operation she will later develop sepsis?

The only way to determine the child's condition is by the strength, regularity and volume of the heart sounds. If it be thought that the child cannot survive, craniotomy is the best

alternative. And right here let me say that the time has passed when any obstetrician can justify himself in doing craniotomy or embryotomy on any but a dead or dying child. The chances are that in the larger proportion of cases under ordinary environment that all aseptic rules have been violated and that the patient is in a fair way to later septic developments. It has been my observation that a large proportion of patients which I have seen in consultation, in whom frequent examinations have been made and prolonged attempts at delivery have been tried by the attendant and his friends whom he has called in to assist him, have developed sepsis in some form afterward, not a few having proved fatal. When the obstetrical attendant is a general practitioner attending erysipelas and other infective diseases, lancing carbuncles, boils, abscesses and the like, is it any wonder that his patients are infected? If we could but impress upon him the fact that hands infected by contact with virulent discharges cannot be made clean by scrubbing and that he either should wear sterile gloves during his obstetrical attendance or while dealing with infective discharges or better to use gloves in both instances, much of this infection could be avoided.

I believe that the larger mortality in Cesarean section cases, after delayed operation, is more due to subpubic infection before section than to the exhaustion before section. This fact is borne out by the experiences of several operators who have done sections frequently after patients have been in labor for over twenty-four hours under conditions such that the labor has been aseptically conducted. In the hypothetical case just described, if the child is decided to be living and liable to live after delivery, we have to choose between Cesarean section, symphysiotomy or pubiotomy. Symphysiotomy has been supplanted by pubiotomy as being by far the safer operation. Williams, of Baltimore, is the most enthusiastic advocate of pubiotomy, in this class of cases, among the obstetric teachers of the day. Hirst and others predict that it will eventually go the way of symphysiotomy, but time and "future observation and study" only can determine the question.

The mortality for both mother and child in primary elective Cesarean section is practically nil. When the operation is done later as a last resort, the mortality of the mother increases, but that of the child does not. The statistics of pubiotomy would seem to show in this class of cases a little better chance for the mother, but not so favorable for the child as Cesarean section. The principal points to obtain, however, are these: a knowledge

long enough prior to term to determine the size, shape and capacity of the pelvis to go to term; then to decide whether to do a premature delivery at 8 or 8½ months, or to do a Cesarean section, or to await the "test of labor" under conditions such that the labor can be conducted aseptically, and if not successful, then to do a Cesarean section under conditions such that the lives of both mother and child may be saved.

Premature delivery in contracted pelves at 8 or 8½ months is a procedure attended with good results, and a child so delivered stands as good a chance of living as at term. Some writers have tried to devise means of determining the size of the fetal head while *in utero*, but it is problematical if anything like an accurate estimate can be made under such conditions. The technic of aseptic abdominal surgery has been brought to a degree of perfection such that Cesarean section, in competent hands, if the patient is not already infected and has enough vitality left to undergo the ordeal, ought to live in a large percentage of instances. Much of the delay and loss of strength of the patient may be prevented during the dilating stage, if it be tardy, by the use of various devices for dilating the soft parts, but among which, it would seem that the Pomeroy bag is the most effective.

CASES OF CESAREAN SECTION.

CASE I.—Mrs. G., age thirty-eight, had born several children at term; at this labor, at term also. It was discovered on examination that a mass which proved to be a large carcinoma of the rectum filled the lower pelvis, preventing delivery. She had been in labor fifteen hours. The cervix lay above the symphysis, partially dilated. Cesarean section done at the Buffalo Woman's Hospital. Male child, living. Both mother and child survived, the mother dying about one year after from carcinoma.

CASE II.—Mrs. S., age thirty-five, in puerperal convulsions, having had several during the previous twenty-four hours; cervix hard and undilated. She was taken to the Buffalo Woman's Hospital and delivered by Cesarean section. The child lived only a short time, the mother recovered and died three months later from renal disease which proved to be an interstitial nephritis.

CASE III.—Mrs. F., old primipara, in labor about eight hours; the pelvis found to be obstructed by a fibroid tumor pushed downward in Douglas' pouch, filling the pelvic cavity. Cesarean section was done at the Buffalo Woman's Hospital. Male child; both mother and child lived.

CASE IV.—Mrs. P., age thirty-five. Found to have a large carcinoma of the cervix and upper vaginal wall, such as to prevent normal delivery. Elective Cesarean section was done at the Buffalo Woman's Hospital, near term; mother and child living. Mother died eight months later from hemorrhage.

CASE V.—Mrs. L., age thirty-two; primipara with a generally contracted pelvis; conjugate about $6\frac{1}{2}$ cm. Patient elected at six months to go to term and have a Cesarean section, desiring a living child. This was done at the Buffalo Woman's Hospital; child and mother both alive and in good health.

64 RICHMOND AVENUE.

THE DEVELOPMENT OF THE HUMAN OVUM DURING THE FIRST EIGHT WEEKS OF PREGNANCY.¹

AN APPEAL TO TEACHERS OF OBSTETRICS AND TO WRITERS
OF TEXT-BOOKS TO CONFORM IN THEIR DESCRIPTION
OF THE HUMAN OVUM DURING THE EARLY WEEKS
OF PREGNANCY WITH THE FACTS ON RECORD.

BY

HENRY SCHWARZ, M. D.,
St. Louis, Mo.

THE descriptions of the impregnated ovum during the first eight weeks of pregnancy, as found in our leading text-books, conflict with well-known facts and should be corrected. All leading American, English and German text-books bring illustrations and descriptions of embryos and ova from the second and third week of pregnancy and they all, without a single exception, state, that at the end of the first lunar month, that is at the end of the fourth week of pregnancy, the human ovum is of the size of a pigeon's egg, and that the embryo at this time measures from seven to ten millimeters. Besides copying the well-known illustrations from the works of His, Reichert and others, each writer of a text-book usually brings an illustration of one of his own cases; thus Edgar shows an unruptured human ovum of perhaps the sixth or seventh week, describing it as from the third week, and Williams brings an illustration of a beautiful specimen in the anatomical museum of Johns Hopkins University, also of about six or seven weeks' development, describing it as a seventeen days' pregnant uterus.

Now all these authors follow the time-honored method of Hippocrates and divide pregnancy into ten periods of twenty-

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

eight days or lunar months, and they describe the human ovum and fetus at the end of each of these ten periods, and they all go on record and state: At the end of the fourth week of gestation, the human ovum is of the size of a pigeon's egg, and the embryo measures from seven to ten millimeters in length.

All these statements are misleading and confusing to students, and they are annoying to the teachers of obstetrics. The fact is, that no human eye has ever seen an impregnated ovum belonging to the first period of four weeks of a forty weeks' pregnancy. The youngest human ovum of which there is a reliable record, is the one described by Peter, of a girl, who should have menstruated on September 28, 1885, and committed suicide on October first of that year, because she considered herself pregnant. This ovum, which has become so well known, was fully embedded and of the size of a hemp-seed. It belongs to the middle of the fifth week according to the established way of counting. Another ovum, a trifle smaller, has lately been described by Leopold, but unfortunately, there is no record of the date of the last menstruation. Investigators, the world over, have during the last thirty years been on a continuous lookout for youngest human ova with the following result: During the first four weeks, counting from the first day of a last normal menstruation, no ovum has ever been found in the uterus. If you consider how searching the investigation has been, and how it has been aided by millions of curettements and many thousands of hysterectomies, you must come to the conclusion that as long as the menstrual period is not overdue, the impregnated ovum has not entered the uterus, and there is no harm in the universal practice of examining, sounding and treating women, who are not behind in their menstruation.

On the other hand, just as soon as a woman's menstruation becomes overdue, the impregnated ovum may be found in the uterus; the luckiest investigators found ova of the size of a hemp-seed fully implanted on the third or fourth day after menstruation was due, that is to say, in the middle of the fifth week; all of us have been looking for these youngest ova, and we considered ourselves lucky when ten, twelve and more days after menstruation was due, we were able to secure ova, varying in size from a small cherry to a pigeon's egg, but all these ova belong to the second lunar month of pregnancy; the earlier ones usually to the sixth week. Many of these ova have been turned over to embryologists, who have studied the degree of develop-

ment of the embryos, and have estimated their age by comparison with animal embryos. His in 1880 published a description of sixteen embryos, obtained in this manner; he estimated their age at from twelve days up, and came to the conclusion that twelve of the sixteen embryos, so examined by him, resulted from the impregnation of the ova of the menstruation which had been missed, and not from the last normal menstruation. From this publication of His, date the illustrations which we so universally find copied in our text-books on obstetrics.

The description given in the text-books of ovum and fetus at the end of the eighth week or the second lunar month, are proven correct by our daily observations, namely, that the ovum is about of the size of a hen's egg, and that the fetus measures about four centimeters in length.

The changes in the description of human ova in our text-books of obstetrics, which I advocate, apply therefore to the first two lunar months of a forty weeks' pregnancy only, and should be as follows: During the first lunar month no impregnated human ovum has ever been observed, we know, however, that during this period the uterus is empty; that during the first part of this period, pregnancy does not exist, and that the part of this period in which pregnancy exists, is consumed by the migration of the impregnated ovum through the Fallopian tubes. We have reason to believe, that, as a rule, the impregnated human ovum reaches the uterus on the day on which menstruation becomes overdue, because, in spite of the most vigorous search of an immense material, carried on through many years by competent investigators, the uterus has always been found empty, as long as menstruation is not overdue, while, on the other hand, the youngest human ova on record have been found three or four days after menstruation failed to appear.

At the end of the fourth week of pregnancy, the human ovum must be small enough to pass through the uterine end of the Fallopian tubes, and cannot be larger than a millet-seed. During the second lunar month, the impregnated ovum grows rapidly, and develops from a body of the size of a millet-seed to that of a hen's egg. The youngest ova on record date from the third and fourth day of the second lunar month, they were fully implanted and of the size of a hemp-seed; at the end of the fifth week the ovum constitutes a small vesicle, covered with chorionic villi, and measuring about one centimeter in diameter; at the end of six weeks the ovum is of the size of a pigeon's egg, and the embryo

measures from seven to ten millimeters in length; at the end of the eighth week, the ovum is of the size of a hen's egg, and the embryo measures about four centimeters in length.

These are the changes which should be made, irrespective of what the authors opinion may be regarding the relationship of ovulation and menstruation, and irrespective of his opinion in the question whether, as a rule, the impregnated ovum belongs to the last normal menstruation, or whether it belongs to the period which has been missed.

These questions were much discussed twenty-five and thirty years ago, and it seemed then, that the so-called new theory had won the day. This theory taught that ovulation preceded menstruation a few days; that, as a rule, impregnation occurred as soon as the ovum reached the ampulla of the tubes, and that the impregnated ovum, as a rule, belonged to the menstruation which failed to appear; that the appearance of the menstrual flow, in fact, was a sign that a chance for impregnation had been missed.

The leading text-books of the present day, however, seem to return to Pflueger's theory, that ovulation and menstruation are simultaneous phenomena, and that it is the ovum of the last bloody menstruation which, as a rule, becomes impregnated. This appears very strange when we consider that a great deal of unshaken testimony had been produced in favor of the new theory, while not one single fact can be brought forward in support of the theory that the ovum of the last normal menstrual flow, is the one which becomes impregnated.

Pflueger's publications date from the year 1865; he believed that ovulation and menstruation take place simultaneously, and considered menstruation the means by which nature prepared the uterus for the implantation of the ovum. The first protests against this theory were raised in 1871 and 1872, but it was Aveling, who in 1874, in the *Obstetrical Journal of Great Britain*, p. 209, gave the first lucid description of the menstrual changes in the uterine mucosa in support of the new theory. The same agent, which causes an ovum to mature and a follicle to rupture, causes likewise a periodical swelling of the uterine mucosa, and thereby renders it suitable for the implantation of the ovum; if such implantation takes place, the swelling of the mucosa continues until the so-called decidua menstrualis is changed into the decidua of pregnancy. When impregnation does not occur, or when an impregnated ovum passes through the uterine cavity

without becoming implanted, the mucosa returns to its normal condition. This swelling off of the mucosa is usually ushered in, and assisted by the escape of blood. Aveling quite aptly compares these changes in the uterine mucosa, to the formation of a nest for the reception of the impregnated ovum, and to the throwing off of such a nest, when there is no chance to utilize it.

Aveling's opinion about the changes in the uterine mucous membrane was soon confirmed especially by the beautiful work of Leopold in 1877 (*Archiv. für Gynäcologie*, vol. ii, p. 110), and when His, in 1880, showed that of the 16 embryos, which he examined, twelve without doubt originated from ova of the first suppressed menstruation, the new theory seemed firmly established.

In 1883, Leopold published (*Archiv. für Gynäcologie*, vol. xxi, part 3) his investigations about ovulation and menstruation, and came to the conclusion that during the period of congestion preceding menstruation a corpus luteum is more apt to develop than at other times, but that follicles may rupture at almost any time. In 1885 followed the discovery and description of Peter's ovum, which likewise supports the new theory.

In 1896 (*Archiv. für Gynäcologie*, vol. xlv). Leopold, together with Mironoff, published further observations made from the examinations of extirpated ovaries in regard to ovulation and menstruation. The material was not free from objections, and the conclusions were different from those reached on the former occasion. Leopold now claimed that the menstrual flow is usually, but not always, accompanied by ovulation, and that ovulation at any other time is a rare occurrence. It seems to be the influence of this publication which has caused a revival of Pflueger's theory; however, without good cause. The statement that ovulation invariably takes place during the menstrual flow, is contradicted by Leopold's own publications of 1883, and by the frequent cases of conception in the absence of any menstrual flow. Such cases are frequent in nursing mothers, they are not rare in girls who cohabit regularly before they have menstruated for the first time, and they are numerous in cases of women, who get married a week or so before an expected period, and who never menstruate again until after the first baby is born.

At any rate, we know that twenty-eight days after the beginning of the last menstruation, the impregnated ovum is almost a microscopical body and just in the act of entering the uterus, and we may take our choice, whether we consider this degree of

development as attained in a few days, or whether we wish to believe, that it has taken three or more weeks to accomplish it.

Personally, I have always taught the new theory. Fruitful cohabitation can take place at any time between two periods. When the spermatozoids have reached the tubes, they are in such favorable surroundings that they will remain alive and active from one period to the other; Duehrsen has found them so in the Fallopian tubes after three weeks; in the domestic hen they remain active for many months and fructify the descending eggs; in the female bat, they remain active from the time of copulation in fall, to the time of ovulation in spring, and in the queen-bee, they remain active for a number of years. There can, therefore, be no reasonable doubt of the ability of human spermatozoids to remain alive and active from one menstruation to another, when once in the favorable surroundings of the tubes; and it is safe to say, the ampullæ of the tubes in a woman, who cohabits regularly, always contains a multitude of spermatozoids, so that the ovum which leaves the ovary a few days before the expected menstruation, becomes impregnated at once; and that during the passage of the impregnated ovum through the tubes, there is not much change of size, if any.

It is likely that the observations of Spee on the guinea-pig, can be applied to the human ovum, namely, that the *Zona pellucida* protects the ovum during its travel through the tube, and is stripped off in the uterine cavity when the ovum becomes permanently implanted.

440 NEWSTEAD AVENUE.

SOLVING THE PROBLEM OF OBSTETRICS.

This was the title of the PRESIDENT'S ADDRESS, delivered by DR. E. GUSTAV ZINKE, of Cincinnati, Ohio (see page 733).

DISCUSSION.

The papers of Drs. Frederick and Schwarz and the president's address were discussed jointly.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, said it was not generally known that Dr. Stamm, a Fellow of the Association was the first in this country to do vaginal Cesarean section.

DR. MARTIN STAMM, of Fremont, Ohio, said that about five years ago he read a paper at the Chicago meeting of the Association, in which he reported two cases of vaginal Cesarean section. The first patient was operated on at her home, sixteen miles from Fremont, as he did not think she could be moved. She made a good recovery. She was pregnant about seven months and a half. The baby gave a few gasps and died.

The second case he saw in the country one evening about eight o'clock. He did not want to perform the operation there and thought it possible to wait a few hours, and told the physician to bring the woman to him and he would operate at sunrise. Patient was brought in about four o'clock in the morning in the summertime, and at about five o'clock was delivered. The baby lived two hours. The mother recovered. It was about eight months after this operation that she gave birth to a child, at seven and a half months of gestation.

About two years ago he saw a patient in whose case vaginal Cesarean section was proposed, but was vigorously opposed by the family, and the woman died.

Three months ago he had the case of a woman who was pregnant seven and a half months. He delivered her in the same way; the baby lived a day and a half, and died. Six weeks ago he had a case at term. This woman had six convulsions within three hours. He operated on her at the hospital; the parts were edematous, and there was an opening just large enough to admit one finger. The operation was attended with difficulty as regards peeling the bladder back, and so he only slightly did this, then made an intrauterine incision in the cervix, and one posteriorly, introduced his hand and dilated. In about two minutes the canal was sufficiently dilated to admit his hand, and after this he turned and delivered the child. The child was living, and the mother made a good recovery. As the President, Dr. Zinke, had said, the speaker could only recommend the operation in eclampsia, yet he thought in placenta previa it would be the operation finally adopted. He would like to hear Dr. Zinke say something about modern extraperitoneal Cesarean section or what was known as Sellheim's method. This was an operation which seemed to offer some prospect for future consideration.

DR. ZINKE replied that Sellheim had abandoned this procedure because of the favorable results obtained by hebostiotomy.

DR. MILES F. PORTER, of Fort Wayne, Indiana, did not think these papers should go without further discussion. If there was one thing he was thankful for it was that he had never done craniotomy on a viable fetus. We were in a position to-day to say that there were better and safer methods of delivering primiparæ than by even the ordinarily difficult high forceps operation.

It was his privilege on two occasions to make what he called the elective Cesarean section. One was in a healthy multipara who had had several previous normal easy labors, but who came to labor and upon examination was found to carry a large pelvic tumor—a cyst. After the removal of the tumor in the ordinary way, he delivered the woman of a child through the abdomen, because he felt certain that under the circumstances he could empty the uterus with less risk to the mother and to the child, and not only so with regard to risk to life, but morbidity itself, than to allow the woman after abdominal section to go through an ordinary labor.

The other operation was done in the case of a primipara, with placenta previa at term. The question of morbidity should be considered as well as mortality. After considerably more thought than experience on this question, he was inclined to believe that abdominal Cesarean section done under favorable circumstances—and it should be done under favorable circumstances—would not have a mortality to exceed two per cent. to the mother. What was the mortality to the child? He undertook to say that time and experience would prove that this operation would give the child a better chance for life than labor in the ordinary way. Therefore, he was very much inclined to believe that difficult labors in the course of time would be comparatively few, and that instead these mothers would be delivered by Cesarean section. Looking at the question from all sides as well as he could, without having had very much experience with vaginal section, he could not understand the logic or the reason for attacking a placenta previa by vaginal section in the presence of a viable child. This was where the placenta was, and this was where hemorrhage would take place. After the delivery of the child one would have the ordinary traumatism to contend with from the delivery of the child through the natural tract. These uteri could be attacked safely through the abdomen, and the rule was that the recoveries were infinitely less bothersome than those from ordinary labor. These women were not sick at all, as a matter of fact. We would have to consider in time the accumulated experience which alone would determine accurately what the subsequent dangers of abdominal section were. What was the necessary danger from subsequent rupture of the uterus? What was the subsequent danger that might take place from the development of a hernia? What was the danger that might follow from the development of intestinal obstruction? But taking all of these things into consideration, he was very much inclined to believe now that in the future abdominal Cesarean section in many of these cases would be the method of delivery adopted by choice as being a method that give the mother as good a chance as any other, and a method which gave the child an infinitely better chance than did any of the other known methods.

DR. EDWARD J. ILL, of Newark, N. J., said that this question under discussion was a large one. So far as he could learn, neither the President nor Dr. Frederick had spoken of the soft parts of the mother. They had referred to the immediate results of operation, but not to the remote. It did not seem to make any difference what sort of operation one did from below, every now and then one would injure the woman to such an extent that she would never be well. He would produce laceration of the cervix extending into the broad ligament, extending down to the vagina into the perineum, producing such an atrophy of the pelvic cellular tissue that the woman would never get well. He had had a very good chance of seeing a few cases that had been operated on by prominent men abroad by vaginal

Cesarean section, and in speaking of it he was not attacking the operation, because he had done it himself. However, he had seen severe injuries resulting from that operation, but believed that if the fetus had been delivered by abdominal section it would have left the woman in good condition, provided the operator knew how to sew up the abdominal wall properly.

He thought there was still a place for the high forceps operation. The President had pointed out that these patients should go to the hospital. This was where they went after everybody had their hands in the muddle. Such a patient might have fever, might be exhausted, with the fetus possibly dead. If Cesarean section were undertaken on such a patient, she would doubtless die. Here the high forceps operation was still the best method. If in such a case hebstostomy was done, the patient was likely to die from sepsis.

One word with regard to Cesarean section in cases of puerperal convulsions. He had done Cesarean section twenty-five to thirty times for puerperal convulsions. They were all primiparæ. Multiparæ would get along without Cesarean section.

DR. JOHN A. LYONS, of Chicago, was glad to hear what Dr. Porter and Dr. Ill had said with regard to Cesarean section. It was difficult to get general practitioners to send cases suitable for this operation to the hospital. They usually allowed them to go on, if their pelves were contracted, until they had been in labor from forty-eight to seventy-two hours; then both mother and child were likely to be lost if the mother was sent to the hospital for operation. This discussion was needed, and he thought it would bring forth good results.

DR. FREDERICK, in closing the discussion on his part, said that in Germany too little consideration was shown to the child. He thought, too, a great many general practitioners in America displayed too little consideration for the child. The teaching among Roman Catholic practitioners to a certain extent counteracted this lack of consideration of the child. The child had its rights, which should be considered, and the mother had her rights, which should be considered. He did not believe the mother should be the sole object of solicitude, but the child should have its share of solicitude also. Therefore, the operation which under the largest number of operators proved to be most successful in saving both mother and child, first as regards mortality, and next as regards morbidity, was the one that would eventually be crystallized and depended on. Obstetricians were in a state of uncertainty; changes were going on. Without question, this would be sooner or later thoroughly crystallized, so that practitioners would know where they stood. Before reaching this point, however, it was necessary to educate general practitioners who were not obstetricians that they must examine their patients early in pregnancy or as soon as they were engaged. They must know what the condition of their patients was. Under the general practitioner was educated up to a certain point, there was going to be very little or no improvement in

the mortality or morbidity statistics in obstetric practice. This was one of the most important points for consideration in efforts to educate the general practitioner. One could talk about pubiotomy, Cesarean section, symphyseotomy, and all other otomies from a scientific standpoint, but when it came to absolute practice, there was the trouble. He had always said in recent years that a poor woman picked up on the street, who had no place to lay her head, and was in labor, if taken to a maternity hospital and delivered there, had a better chance than the rich woman in a mansion with nurses and obstetric attendants.

DR. ZINKE, in closing the discussion, felt deeply grateful for the expressions of appreciation regarding his address. He thought those who would take the trouble of reading the papers presented this evening after they were published, would have little doubt as to the logic expressed in them and the conclusions to which the authors had arrived. We were on a campaign of education with respect to obstetrics. A great deal had been done for mankind in every other department except in obstetrics, and if only as much were done for the pregnant as for other people, who sought treatment, he thought these women would stand a better chance to recover from the effects of their confinement than at the present time. There was no question in his mind that many fathers and mothers often dreaded the thought of the marriage of their daughters, and after they were married they were in dread of pregnancy, and when pregnancy did occur, they feared the hour of confinement. Many of them avoided it for that reason, and he hoped that the time was not far distant when the laity, as well as the profession, would realize the fact that cases of obstetrics should be as closely observed and as carefully studied as other cases, and that they should be treated accordingly. If there was any indication of trouble in an approaching confinement, the patient should be sent to a place where she could be conducted through it successfully.

September 23, 1908, Second Day.

There was no morning session of the Association held. Instead, the members repaired to the Johns Hopkins Hospital, where clinics were given by Drs. J. M. T. Finney, Harvey Cushing, Howard A. Kelly, and Guy LeRoy Hunner.

Second Day, Afternoon Session.

INTRALIGAMENTOUS FIBROIDS.¹

BY

JOHN F. ERDMANN, M. D.,
New York.Professor of Surgery in the New York Post-Graduate Medical School and Hospital;
Surgeon to Gouverneur Hospital.

(With Illustrations.)

DURING the past seven years I have operated upon sixty-one cases of fibroids, doing forty-eight hysterectomies and thirteen myomectomies. Of this entire number I have met with five cases of intraligamentous fibroids, one of which was a case of multiple fibroids of the uterus, with two discrete ones in the right broad ligament. The remaining four were true intraligamentous fibroids in the full sense of the word. None of these intraligamentous masses in any of the five cases had any association with the uterus, except one in which the association was due to an inflammation occurring in the pelvis, and an exudative or plastic adhesion to the uterus was evident.

In looking up the literature in the spring of 1907, when selecting this title for a paper to have been read before this Association at its meeting in Detroit, I was struck by the fact of the few cases being cited and by the meager descriptions in the text-books of the present day. Such a strong impression was made upon me that I felt that this subject is either an exceptionally rare one or so common as not to deserve mention. I am now firmly of the belief that the condition, while not unusually rare, had not been well written up at that time, and am more than ever of such an opinion after reading the excellent paper of James Vance, of El Paso, Texas, published in the *Annals of Surgery* of 1907, p. 854, vol. xiv, No. 6. In the above-mentioned article Vance says: "It is only in cases of broad ligament development alone, associated with a perfectly normal uterus, that the primary origin is so obvious as to compel the attention of the surgeon. Such cases are very rare, there occurring only four in the past eleven years in the American literature."

As stated above, I record in this paper four out of five in which just such a condition of normal uterus existed with the fibroid,

¹Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

the fifth being the case of multiple fibroids of the uterus and two in the ligament. It is also an interesting fact that these tumors are usually single. The four mentioned above were single fibromata.

Vance is quite settled in his convictions that these growths are neither budding offshoots from the uterus nor pedunculated subserous ones that have finally separated from the parent stem, but that they are primary developments in the broad ligament. "Numerous authorities are cited by Krekels to show the independent origin of these growths. That fibromyomata are found within the broad ligament as well as in the uterus is natural, since the same smooth muscle fibers and connective tissue are found here as in the uterus." (Vance, *Annals of Surgery*, vol. xlv, No. 6, p. 863.)

The ages in my five patients were forty-two, forty-eight, forty, forty-four and forty-nine. All were married except the one forty-two years of age, and she had been a widow for several years at the time I was consulted. The sizes varied greatly. In the one with multiple fibroids of the uterus and two in the broad ligament, one of the tumors was the size of a filbert, while the other was as large as a hen's egg. The largest was one of the left side and in the patient forty-eight years old. It extended above the umbilicus, and was judged to weigh thirteen to fifteen pounds. The next in size was also a left-sided one, perfectly round, of rather soft consistence and as large as the inflated gas bag of the present-day ether inhaler, weighing ten pounds. The remaining two were both right-sided, one as large as the largest grape fruit, the other but slightly smaller.

The histories in regard to growth are illuminating in but two, and these were the largest ones. One observed her growth for five years, and its growth was so rapid as to lead one to suspect a cyst of the ovary or an intraligamentous cyst, although I stated distinctly that I thought it to be a fibroma. But one of these single growths was nodular, Vance stating that when large they usually are. In four of these cases the tumors were hard or of the same consistence as ordinary fibroids. In the large round one the feeling was of a decidedly soft nature. The edematous condition spoken of by some authors was not observed in any of my cases, although the largest one, which was somewhat pear-shaped with the apex down, had perforated the anterior vaginal wall and was very adherent. Such a condition of edema may have existed in this case, with a subsequent in-

flammatory change producing sloughing and perforation of the vaginal wall, but the patient's history was negative as to any pelvic inflammation.

Diagnosis.—This condition is usually confused with that of an intraligamentous cyst, although from my experience in the five cases cited in this paper, the deflection and elevation of the uterus in the large tumors is greater than in intraligamentous cysts. I am satisfied that no positive conclusion between the two can be formed until the abdomen is opened. The menstrual history is not one to base any definite conclusion upon. This fact is also well borne out by Vance, who says, "The unaffected condition of menstrual function is the most constant symptom remarked upon by all authors."

Pressure symptoms are absolutely allied to those of intraligamentous cysts and fibroids. The growth is usually slow, this being in contradistinction to intraligamentous cysts. Immense elongation of the vagina, with a tumor, not movable to any great extent, that can be definitely stated as being harder to palpation than cysts, with the uterus tilted to one side and raised above the symphysis, is very likely to be an intraligamentous fibroid. Treatment is distinctly operative, and varies with the size and position of the growth from a myomectomy or enucleation to a hysterectomy. In the case of multiple fibromata I did a myomectomy, removing six from the uterus and the two from the ligament. In the remaining cases supravaginal hysterectomy was done. In the operative treatment two dangers are distinct. First, that of hemorrhage from the iliac and its branches and, secondly, the danger of ureteral trauma.

Hemorrhage.—Two of the five cases operated upon were accompanied by terrific hemorrhages. The first hemorrhagic case was in the patient with the large pyramidal tumor, mistaken throughout by all, even during the operation, for a large myomatous uterus (see history). The cleavage was badly made owing to a dark day and a very poorly lighted operating room. Vessels were found in the broad ligament and covering the tumor a half-inch in diameter with extremely thin walls. In lifting the incarcerated tumor from the pelvis numbers of these branches were torn and bled profusely. Withal, the patient's recovery was without any incident of unusual note.

The second instance (see Case II) was in the case of recent and existing inflammation, the patient having a temperature of 102 at the time of the operation. Her hemorrhages were exception-

ally severe, and evidently came from the broad ligament plexus, deep down in the pelvis and close to the pelvic wall. It was necessary to place very firm packing between the tumor and the pelvis having an assistant make firm pressure upon the packing, and then, to save the patient's life, I hurriedly dissected the tumor up from its posterior attachment. Upon removing the packing, the spouting vessels were readily seen and clamped.

Ureteral dangers are, in my opinion, only marked in cases complicated by preexisting inflammations in the tumor or broad ligament or in cases with tubal or ovarian adhesion involvement. In the previous inflammatory cases, of whatever variety, the ureter can be so closely matted to the tumor as to be injured by hurried dissection, as was necessary in Case II. In Case II, while hurriedly releasing the tumor from its posterior and inferior association, no good cleavage was obtainable, and as a fearful hemorrhage was in progress I began to work hastily, and suddenly found a hard infiltrated cord between my fingers and entering into a portion of the tumor. I took it to be a large vessel or the ureter. Upon investigation it was proved to be the ureter, which was buried in the adhesions and closely associated with the tumor. Careful dissection, after the hemorrhage was checked, released the ureter without damage. In the noninflamed and nonadherent cases the tumor usually peels out without danger to the ureter, this latter structure being separated from the tumor by a fair amount of intercellular structure. Furthermore, no anatomical reason exists for ureteral danger in the ordinary case, except the usual one near the cervix when doing a hysterectomy.

The choice of operation, as stated, lies between myomectomy and hysterectomy. Myomectomy is the operation of choice when the tumor enucleation is feasible with readily controlled hemorrhage or the tumor is small enough not to push the uterus out of the pelvic cavity and leave a raw space in the broad ligament of such dimensions as to be provocative of malpositions by lateral or posterior tilting, thereby requiring subsequent operation. Also, certainly, myomectomy should be the operation of choice in young adults with child-bearing possibilities.

Hysterectomy.—Where the tumor is large, enucleation will leave an immense cavity with loss of lateral support in the broad ligament which is very likely to be productive of retrodisplacements and lateral deflections which will eventually call for secondary operations. A further and a very potent reason for hysterectomy

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tomy is that of the control of hemorrhage. Age as a factor lends its weight after forty.

CASE I.—Mrs. J., forty-eight, Bridgeport. Referred to me by Dr. R. J. Lynch. Came under my observation on September 12, 1905, and gave the following history: has had four children, the first pregnancy occurring at the age of sixteen. She has been regular in menstruation as to time and quantity, never soiling more than three napkins daily and this condition continuing for about three days. Had never noticed anything except a lump in her right side, which was movable, about eight years ago. She said that there had been an appreciable increase in size lately. Dr. Lynch stated that it had more than doubled in size in the last three years. She states that it has been impossible for her to retain her urine for the past two years, as it "continually leaks away" during the entire time she is walking, and that she must arise three or four times at night to void urine. Her bowels move regularly and she suffers some pressure discomfort.

Examination reveals a mass fairly movable, inclining more to the left than the right, extending above the level of the umbilicus, and having to the palpating hand the shape, density and the like of a large fibroid uterus. By vagina a distinctly confusing palpation picture is presented. A conical mass (see illustration of Case I), the apex of which is the size of a small orange, presents in the vagina, encroaching upon the left side mostly and descending to within an inch and a half of the vulva, with a tongue-like process that was about two inches long and an inch and a half wide and covered by a perfectly smooth membrane. No external os could be felt. Ocular examination through a speculum presented no evidences of an external os, and demonstrated that the tongue-like protrusion was covered with what appeared to be true mucous membrane. Operation was advised and accepted.

She was operated upon on the thirteenth day of September in an improvised operating-room, poorly lighted and upon an extremely dark afternoon. A long median incision exposed a tumor with all the character of a diffuse fibromatous uterus, covered with veins fully a half to three-quarters of an inch in diameter. There were no adhesions, but the tumor was absolutely fixed in its lower half, the apparent mobility found at the first examination being due to the swing of the upper half of the tumor upon its lower half. The left round ligament could not be demonstrated. The left broad ligament was extremely short

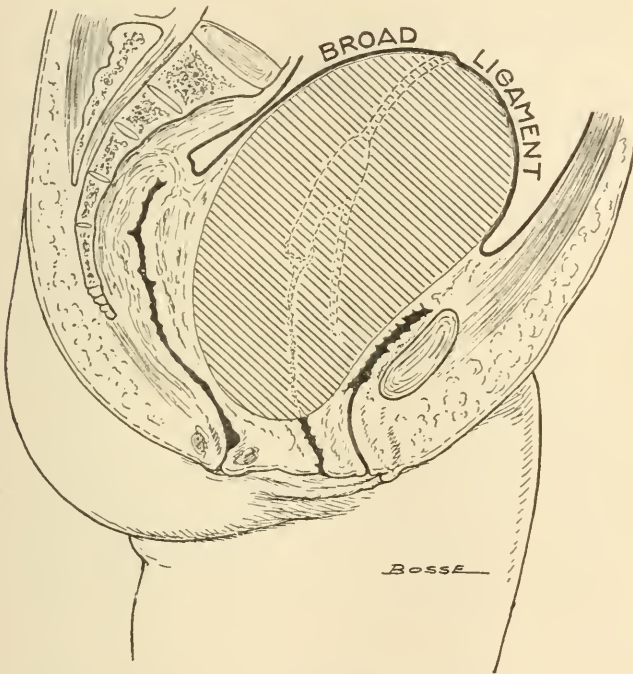
and tense, also containing immensely dilated veins. The ordinary steps of doing a bilateral clamp hysterectomy were proceeded with, accompanied by great difficulty in the left side, the latter due to the fact that we could not or did not know the exact nature of our tumor. Had I recognized it as an intraligamentous fibroid, I feel that the greater difficulties met with could have been obviated. Repeated tearings of vessels, owing to thin walls, were followed by terrific hemorrhages until the pelvic portion of the tumor was reached. After this it was a simple matter, although the growth had ulcerated into the vagina, to complete the hysterectomy from left to right and from below upward. A careful peritoneal toilet was made, her appendix removed, and the patient placed in bed with instructions to give a large salt-solution enema. The patient recovered.

Examination of the tumor proved interesting. Search was made for the external os with great care, but none was found. A transverse section was made three inches up from the apex, with like result. Another incision three inches higher with like result. The third section, three inches higher, gave evidences of a small canal lined with mucous membrane, simulating the vagina. This was traced up and to the extreme right of the base of the tumor, and perfectly free from it except by cellular tissue we found a normal-sized uterus. The tumor measured fourteen inches in length, eight inches wide at its base and five and a half inches through at its thickest portion. It was estimated as weighing between twelve and fifteen pounds.

CASE II.—Mrs. L., age forty, mother of several children, menstrual history negative. Referred to me by Dr. Spanier on May 23, 1907, when I saw her in Brooklyn. At that time she had a temperature of $102\frac{1}{5}$ and a pulse of 110. She was unable to retain her urine, and had been treated by some local physician, up to the twenty-second of May, for a cystitis (?), being catheterized, without obtaining diagnostic urine. Dr. Spanier, when called on the twenty-second, made a diagnosis of pelvic abscess encroaching upon the bladder to such a degree as to be productive of the frequency of micturition. Upon examination I found a large mass to the right, extending well above the crest of the ilium and down into the pelvis, quite painful to the touch, not mobile, and a bladder absolutely empty. A diagnosis of inflamed fibroid was made, with possible pelvic abscess.

On May 23 she was operated upon by me at the Private Hospital Association. It was seen immediately upon exposing the tumor

that I had a right intraligamentous fibroid to deal with, and one that was held in the pelvis by a newly formed exudate. The broad ligament was cut just back of the round ligament and a cleavage readily found in the entire superior aspect, but upon making blunt dissection with the finger below the pelvic brim a fearful gush of blood was met with. Packing rapidly with a wet towel and pulling up on the tumor, while my assistant made firm pressure upon the packing, I began rapid dissection below,



CASE II.

until meeting with a cord-like band, the size of a lead-pencil, that apparently had entered into the tumor. This I thought might be a large vessel, but upon observation I found it to be the ureter. The hemorrhage was checked, and then careful dissection released the ureter from the mass. At this stage I was able to raise the tumor sufficiently to clear it from association with the uterine artery. The uterine artery was clamped and a supravaginal hysterectomy was done from right to left and from below upward. There was absolutely no association with the uterus, except by inflammatory exudate, the uterus, being

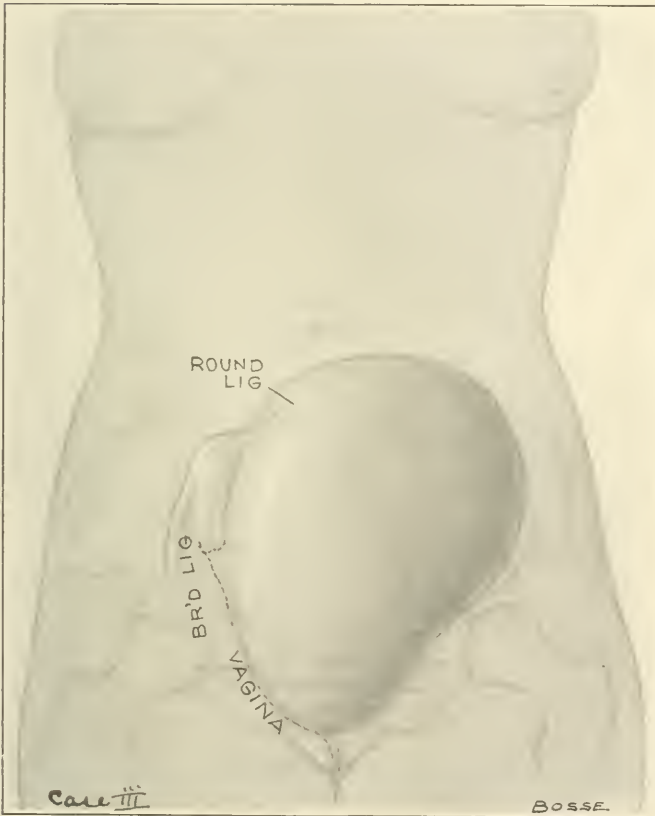
perfectly normal in all macroscopical aspects, and lay well elevated from the pelvis and to the left, the cervix being behind and above the pubes. The question of drainage was decided in the negative, although I felt that my judgment in this case was rather shaky. Some seven or eight days of a fair convalescence followed, then a rise in temperature to 104 degrees, preceded by a chill, with pain in the right side, occurred. This necessitated a vaginal puncture and drainage for a few days, and was followed by an easy convalescence. The tumor was the size of a large grape fruit.

CASE III.—Mrs. H., forty-four, Carlstadt, N. J. Recommended by Dr. Sittenberg, September 29, 1906. Has had several children, the last child about five years ago, when she noticed some enlargement of the abdomen, since which time she observed that her abdomen was growing rather rapidly. Menstrual history was absolutely regular until three weeks ago, when she menstruated a second time within four weeks. Subsequently she menstruated twice more in three weeks, each of these periods being of two or three days' duration. There are no rectal or vesical symptoms. Complains only of a sense of weight in the left side and of the physical appearance, now appearing to be seven months pregnant.

Examination.—Large, moderately fixed, circular tumor. Uterus can be palpated through the abdominal wall to the right, high up. Diagnosis is made of a broad ligamentous cyst, or intraligamentous fibroid. Operation done a few days later at the Private Hospital Association. Preliminary examination under ether, diagnosis in all probability intraligamentous fibroid, although rather soft.

Upon opening the abdomen it was rather a question by palpation, as the tumor had a decidedly fluctuant feel, between a thick-walled cyst and a fibroid. Splitting the layers of the broad ligament, a cleavage was found that throughout the enucleation was productive of no loss of blood nor adhesive obstruction. This was a typical case for enucleation except for the immense cavity left, so hysterectomy was decided upon. The uterus with the tumor was pulled to the right, and a supravaginal hysterectomy was done from below upward and from left to right (see Fig. Case III). The patient was discharged to her home on the fourteenth day.

CASE IV.—Mrs. G., forty-nine years of age, consulted me on June 5, 1907. Married twice, the second marriage about one year



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before admission. Gave a history of having one son twenty-one years old. No other living children. No menstrual history of any difficulties, delays or floodings until the past month, when she skipped. When seen by me she was in her sixth week without menstruating, had some symptoms of pregnancy which could have been attributed to worry, also some slight painful contractions in her right side. Vaginal examination showed a movable mass about the size of a four to six weeks' tubal pregnancy. She was told that it was possible that a tubal pregnancy existed, although a cystic ovary, etc., might be present. Operation was advised. She was referred to a leading gynecologist, who not only confirmed my conclusions, but insisted that for her good she be operated upon without delay. She readily consented, and was operated upon the following day.

Upon making a bimanual examination under ether, the mass before mentioned was easily mapped out and, in addition, a tumor of the right broad ligament was found. Abdominal section revealed an intraligamentous fibroid of the right side about the size of a grape fruit, and in the pelvis a cystic ovary the size of a hen's egg. Hysterectomy was readily done, and the patient discharged to her country home on the twelfth day.

CASE V.—Mrs. C., referred to me by Dr. Alport, of Chicago, in September, 1901. A widow, forty-two years of age, the mother of three children. No other pregnancies. Complains at present of a frequent desire to urinate and some pressure sense about the bladder and rectum. Had worn a pessary "for an anteverision" for one week before visiting me. Menstruation regular and not excessive, but she thinks that the quantity has somewhat increased for the past twelve months. Has been curetted for the increase with no benefit.

Examination.—Uterus apparently enlarged. Mass to the right side in the broad ligament about the size of a hen's egg, hard as a fibroid. The space between the uterus and the mass was estimated as that of fully three-quarters of an inch. Uterus freely movable and nodular. I advised the removal of the growths on the ground of pressure symptoms. She was seen by an eminent consultant, who inclined to a sarcoma of the ovary and also suggested removal. She consented to operation, requesting, if possible, that the uterus be saved.

Operation revealed a multiple fibroid uterus and two discrete fibroids of the right broad ligament, one as large as a hen's egg, and a second about the size of a filbert. Each of these was

readily enucleated, the hemorrhage being controlled with suture ligatures. The uterine masses were readily enucleated.

The patient was sent home in her third week. Fig. II represents a sagittal section with the uterus, and the vagina traced in the oblique shading of the tumor.

UTERINE FIBROMATA COMPLICATING PREGNANCY.¹

BY

WILLIAM J. GILLETTE, M. D.,

Toledo, Ohio.

THOUGH our knowledge of uterine fibroids has during later years greatly increased and their surgical treatment in uncomplicated cases is now about all that can be desired, owing to the careful, conscientious clinical and pathological work of many laborers in this field, there yet remain various conditions which they complicate, the treatment of which is not yet fully worked out, one of the most important of these being pregnancy. At present we have no great data by which to be guided as to the best method of dealing with this complication, though within recent years reports of cases are more frequently appearing in the literature.

It is, of course, well understood that a large proportion of women having fibroids remain sterile. Hofmeier (1) says 25 per cent., Olshausen (2) 30 per cent.; while statistics collected by Noble (3) would indicate a larger number; and that when pregnancy does occur in a fibroid uterus, the increased dangers encountered over those of the normal condition are many; obstruction to labor, sloughing of the growth and abscess of it, malpositions of fetus, prolapse of cord, placenta previa, abortion, ectopic gestation, postpartum hemorrhages, rupture of the uterus due to weakness of the uterine wall by reason of the presence of the fibroid, internal hemorrhages, excessive vomiting, intestinal obstruction, excessive abdominal pain, "threatening symptoms referable to heart and lungs," dangerous pressure on ureters, and rapid emaciation, present a formidable array, and should invite our most serious consideration. Of the nineteen cases of pregnancy reported by Noble (3) in his statistics of fibroids, six, or 30 per cent., were ectopic, which would indicate the extreme frequency of this condition in their presence. He says that small subserous

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fibroids frequently prevent conception by displacement of the adnexa.

The location of the growth in the uterine wall, according to Montgomery (4), determines the possibility of pregnancy, "the submucous or interstitial variety increasing the disposition to sterility by reason of the accompanying endometritis; while the growths that do not especially encroach on the uterine cavity, as the subperitoneal, should not, and usually do not interfere with conception." That fibroids predispose to abortion seems to be the opinion of many observers; but the same author says, "a study of the statistics of pregnancy does not seem to show an increase of the frequency of such interruption over what is found to occur in uncomplicated pregnancy." That abortion is, however, more frequent in the presence of fibroids is borne out by the observations of others, especially Pinto (5), who found that when the placenta is so situated that it lies directly upon the fibroid, its nutrition is so interfered with that it atrophies, when abortion is likely to occur.

In view of the dangers encountered, a number of progressive surgeons have within recent years seriously advised and carried out prophylactic and curative operations in conditions of fibroids complicating pregnancy, and now a sufficient number have proved successful to demonstrate their life-saving value for both mother and child. Myomectomy in the unimpregnated uterus, in certain selected cases, has now become a well-recognized procedure. Though not within the scope of this paper to consider, I may say, in passing, that many have been performed with subsequent pregnancies; and its success may be estimated by the fact that I have only been able to find one case reported, and that observed by Professor Duhrssen (6), in which trouble had ensued by reason of the operation. This was a case of rupture of the uterus through the old scar during labor. I must acknowledge, however, that I have examined the literature only over the last five years and that somewhat superficially.

The curative operations employed have been the radical hysterectomy and the conservative myomectomy: the latter done either by way of the vagina or abdomen. This paper deals alone with the abdominal route. Operations also have been done for raising and fixing the tumor and uterus outside of the pelvis and within the abdominal cavity, so that their enlargement as pregnancy proceeds is not interfered with. The considerations which have led surgeons to operate have been con-

tinuous pain over the abdomen; severe pressure symptoms on vital organs produced by the growing uterus and tumor; manifest obstruction to the pelvic outlet sufficient to seriously interfere with the delivery of the child; evidence that abortion or premature labor is impending; excessive vomiting; interference by the tumor with the upward extension of the uterus, inflammatory and strangulatory complications; necrotic changes in the tumor with sepsis due to twisted pedicle, and rupture of the uterus.

In the absence of some one or more of these indications, interference by operation would hardly be warranted, for many cases, even when the tumor has been of large size, have been delivered without trouble, and the entire process of parturition normally concluded. The production of abortion in this condition is generally considered to be accompanied by grave danger and, aside from ethical reasons, should but rarely be considered as the low vitality of the growth predisposes to sepsis and its presence in the wall by interfering with uterine contractions causes hemorrhage.

When operation is decided upon, it becomes at once a grave question as to its character, and especially to determine whether myomectomy or hysterectomy should be done. This often can only be decided after the abdomen is opened. Myomectomy must be based upon the location of the tumor in the uterine wall, its size and the period of pregnancy. It is held by many well fitted to judge that myomectomy is only permissible prior to the fifth month, but I note that Mann (7), with complete success, removed a large fibroid at the end of the sixth month. I have not been able to find anywhere recorded a case of myomectomy done successfully later than this. With reference to the location, Dr. Boldt (8) would confine operation to subperitoneal and pedunculated tumors, and Doran (9) to such as are situated below the brim of the pelvis; while Bonifield (10) says it should be limited to those cases in which the fibroids are not numerous and in which they can be easily enucleated.

Montgomery (11), at the meeting of the American Medical Association in 1906, reported three cases in which the tumors were interstitial, and in one "at least two-thirds of the uterine wall was entered," the cases all going on to term and being delivered normally. In one of these the tumor, after enucleation, measured four by five inches in diameter. Carstens (12) reports another interstitially situated, successfully removed, which meas-

ured two by five inches in diameter. In fact, a number of cases are now recorded in which interstitial growths have been removed without interfering at all with the progress of pregnancy and parturition, as have also multiple tumors. With reference to size, the largest I have found recorded weighed eight pounds, reported by Miles F. Porter (13), of Fort Wayne; in this instance also the child was carried to term and born without any trouble. Whether interstitial or subperitoneal, his report does not say, but it is safe to assume that it was subperitoneal. Another, reported by Mischnow (14), was the size of a child's head, pregnancy at five months, delivery at term being normal.

The following case also illustrates that the removal of an interstitial growth is not necessarily followed by an interruption of pregnancy, and that this operation may be of value in dealing with an otherwise uncontrollable vomiting.

CASE I.—Mrs. H., referred to me by Dr. D. E. Haag, of Liberty Center, O., age thirty-three, the subject of a hip-joint disease, has menstruated very freely for a number of years. Was admitted to Robinwood Hospital in Toledo, March 24, 1908, pregnant three months. Has an interstitial fibroid size of a small orange in anterior wall of uterus, in lower and middle segment, so located that it is giving much concern as to its effect upon the progress and delivery. Vomiting is frequent and uncontrollable, giving rise to much distress. March 26, 1908, I operated, removing the tumor by enucleation. It was deeply interstitial. The incision in the uterine wall was carefully sutured in layers with ordinary catgut. Hemorrhage was not sufficiently profuse to occasion concern, the sutures controlling it without difficulty. Recovery was prompt and uneventful, except that on the third or fourth day uterine contraction began, with some discharge of blood. The pains were controlled by morphia, and after a week or so the bloody discharge ceased. The severe vomiting almost immediately came to an end, though slight nausea continued. So far as can be determined, the operation has not in any way interfered with the progress of her pregnancy.

Dr. Mc. Murtry (15), in a paper read before the Southern Surgical and Gynecological Association, says, "Small tumors in any part of the uterus very rarely interfere with pregnancy or labor." While without doubt this proposition is true, yet the importance of these small growths must not be underestimated. In an instance recently occurring in my own practice, in which I operated on an eleven months' case of extrauterine gestation, the child pre-

sumably dying soon after full term, a small fibroid, no larger than a good-sized hickory nut, was found imbedded upon the uterine wall, just below the exit of the Fallopian tube and evidently interfering with its lumen and function. I am quite convinced that its presence constituted the chief etiologic factor of the trouble. Other small fibroids, none of them larger, were distributed through the body of the uterus.

A brief report of the case is as follows:

CASE II.—Mrs. K., referred to me by Dr. Calvin Chollette, of Toledo, O., was admitted to Robinwood Hospital, in Toledo, August 9, 1908. She had had one child thirteen years ago; no history of pelvic peritonitis; no miscarriages or severe pain which might indicate a ruptured tube; was quite regular as to menstruation until ten or eleven months ago, when it ceased and did not reappear until two weeks prior to operation, when there was a slight flow. She had first noticed an enlargement of the abdomen seven months prior to my examination. It now extends two inches above the umbilicus. It has slowly diminished in size during the past two months. When she ceased menstruating she had thought herself pregnant. Eight weeks prior to admission, she began to have chills lasting for an hour at a time. Former weight, 165; present weight, 115 pounds. Pulse 90, temperature varying from normal to 102.

I operated August 11, 1908, removing with some difficulty the fetus with its inclosing sac. The sac was strongly adherent to the intestines and pelvic viscera. The uterus was found to be but little enlarged, though its wall contained a few small fibroids, the largest of which, the size of a shelled hickory nut, was enucleated from the right horn of the uterus below the exit of the Fallopian tube, in which the pregnancy had evidently occurred.

From time to time cases have been reported in which the abdomen has been opened by reason of symptoms produced by the impaction of a fibroid in the pelvis; and when the uterus and tumor were lifted into the general cavity, relief from them followed. Two such cases have occurred in my own practice. In one a living child was delivered as term without trouble; in the other, forceps were employed and a dead child delivered, the mother recovering with difficulty. An examination of the first case a few months after revealed the fact that her fibroid had almost entirely disappeared—the only instance of the practical disappearance of such tumor coming under my own observa-

tion, though a number have been observed by others and carefully noted. Doran (16) has collected thirteen cases in which the tumor had disappeared.

The question as to whether fibroids may be removed with safety during the progress of labor and the uterus conserved, is one of a good deal of interest. In a case of Porro Cesarean operation which I performed, after the patient had been in labor for sixty hours, in which the tumor was as large as a fetal head, attached to the uterus near the fundus by a pedicle about two inches in diameter, it seemed to me upon examination of the specimen afterward, that it alone might have been removed at the time and the uterus saved. The case was reported in the *Medical Record* for July, 1900.

The points I wish to note in this paper are, that in the presence of a pregnancy,

1. Should operations for the removal of fibroids be limited to the fifth month, and if not and limited to any time, what should that time be?

2. That not only pedunculated and subperitoneal tumors may be removed, but interstitial as well, without interruption of pregnancy.

3. That even very small fibroids may be so situated as to become of lethal significance.

4. That fibroid tumors may practically disappear at this time or shortly subsequent to it.

5. The possibility of the removal of pedunculated fibroids during labor, allowing it to progress naturally.

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MYOMA OF THE CERVIX UTERI.¹

BY
F. REDER, M. D.,
St. Louis.

OPERATIONS for the removal of uterine fibroids, irrespective of their location, always command the most serious consideration. Our diagnosis has occasionally led us unexpectedly into the gravest surgical work, because of an error in not properly determining the relationship of the tumor mass to the uterus. Then again, gratifying surprises have illumined the operative field as the progress of the work showed that in expectation of a severe task, one of a mild nature has been encountered.

Fibroid tumors of the cervix are very much less frequent than those of the body of the uterus. The cervical tumors that I have seen in the practice of my colleagues I can readily recall. In my own practice I have had but four. The fibroid tumors of the cervix uteri I refer to were good-sized masses filling the vagina and, unlike the smaller fibroid tumors, such as a pedunculated fibroid polypus, simply protruding into the vaginal canal. A tumor originating in the cervix presents the same characteristics as one found in the body of the uterus. In the extravaginal cervix the varieties may be of a submucous, interstitial or subperitoneal nature, while in the intravaginal portion these tumors obviously must be either interstitial or submucous.

The tendency of a cervical tumor is to grow downward into the vagina. Ordinarily it can be differentiated without much difficulty from an inversion of the uterus, a condition that sometimes invites diagnostic difficulties. Rarely do these tumors attain a large size, and this is fortunate, because their removal by enucleation and traction through the vagina is the proper procedure. The disturbance of the normal topographi-

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

cal relations caused by the growth of such a tumor often makes it difficult to place its origin. This is the crucial point to be considered, for upon it will depend a successful removal.

Some tumors of the cervix are more favorably situated than others; enucleation then may be an easy procedure. In two cases under my care I cannot say that I had the good fortune of an easy enucleation. It was only after the most trying work supplemented by the application of a pair of obstetric



FIG. 1.—Diagram showing tumor in situ.

forceps, that it became possible to drag the tumor down sufficiently and relieve its firm upper attachments, which were beyond the reach of my finger. The method in the use of the forceps as applied to tumors in the vaginal canal is precisely the same as in an obstetrical case. The tumor is delivered like the head of a child and I may say that in these two cases the extraction of a full-grown fetal head would have been a less trying task than the delivery of these tumors. In both cases the tumor

mass was as large as a child's head, but its compressibility was very much less.

The traumatism to the vaginal canal in one of these cases was of so severe a nature, that I wish to remark about it. After the removal of the tumor the vaginal canal presented really an appalling appearance. From the enormous distention that the vaginal walls suffered (this patient was a virgin), the attachment of the vagina to the descending ramus of the pubis on either



FIG. 2.—Fibroid tumor of cervix uteri.

side had been completely severed, so that practically the whole posterior and lateral walls of the vagina were floating loosely in the wound. Restoration was difficult; however, I succeeded in uniting all the torn surfaces with suture, bringing the appearance of the parts as closely to their normal state as was possible. This patient made an excellent recovery.

Of the difficulties encountered in the removal of such tumors I may make mention of the third case. The tumor mass presented

such an unusual hardness that it was extremely difficult to start the operation. The growth was protruding between the labia and its size was such that it filled the whole vagina, making it impossible to peel the capsule away from the tumor. With the aid of a sharp spoon (Fig. 3) I began to excavate the growth about its center till I was able to make sufficient room to work between capsule and tumor. Frequent recourse to this method of morcellement facilitated its removal, which was accomplished without accident.

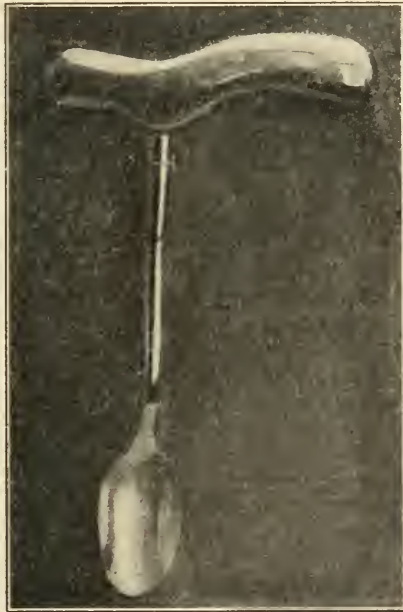


FIG. 3.—Sharp spoon for excochleation.

The specimen which I beg to present on account of the interesting features attached to it was removed from an unmarried woman about thirty-two years of age. Seven years ago an attempt was made to remove this tumor. At that time it was large enough to fill the greater part of the vagina. Eliminating the gloom it cast over the life of this young woman and an occasional hemorrhage, this growth was the cause of little discomfort to her. The attempt at removal was abandoned, the surgeon pronouncing it too hazardous an undertaking. Both ovaries and tubes, however, were removed under the promise that improvement

would follow. The promise made for this radical operation was in part realized. Menstruation promptly ceased, the hemorrhages were arrested and it was thought for a time that the tumor was contracting.

For five years the life of this woman was a fairly comfortable one. Then severe backaches set in, urination became difficult and the vaginal discharges became annoying. For the following two years a life of increasing discomfort was tolerated, when a severe rectal distress manifested itself, which caused her to again sum up sufficient courage to ask for the removal of the growth. Examination, rendered difficult by the narrowness of the vaginal introitus, showed the vagina and the whole true pelvic cavity filled by a large, hard, immovable mass. I was not able to demonstrate the external os, but by the shape of the tumor I inferred that it must be behind and above the symphysis.

Bimanual palpation revealed a small rounded body above the symphysis pubis, which was interpreted to be the fundus of the uterus. On either side it was impossible for me, per vaginam, to determine the extent of the attachments of the tumor. The diagnosis of fibroid tumor, situated in the posterior portion of the cervix of the uterus and growing down into the pelvis between the layers of the broad ligament, was made. If I do not err, tumors growing below the posterior pelvic peritoneum are very rare. It was not difficult to recognize the formidable position of the growth, neither was the task of its removal underestimated.

Although conditions looked inviting for its removal by enucleation per vaginam, I was deterred from pursuing that course by the previous laparotomy, fearing the resulting adhesions that I expected to meet. During the progress of the operation this anticipation was strongly realized, and I could not help but feel a keen sense of appreciation for my colleague's prognostic skill. The preliminary inspection after the abdominal cavity had been opened presaged a rather discouraging outlook. Here was the bladder high up in the abdomen, evidently glad at its escape from injury, for I came within a hair's breath of cutting into it. This viscus was a source of much annoyance, it being in the way almost constantly. There was no room, no place where it could be tucked safely away.

The obliteration of Douglas' culdesac by the growth caused the sigmoid flexure to be raised out of its normal bed. It was spread out flat over the greater portion of the tumor and was closely ad-

herent to it. The severing of these adhesions was accomplished with considerable difficulty, and although the ovarian vessels had been secured at the time of the oophorectomy, the bleeding was profuse and troublesome. It was at this stage of the operation that the greatest relief was experienced in not having attempted the removal of the tumor through the vaginal canal. After having freed the sigmoid and some dense omental adhesions, I experienced little difficulty in working through the pelvic peritoneum near the brim of the pelvis, and in this manner freeing the tumor from the rectum. By keeping close to the mass and using considerable tractile force during the enucleation, I was able to overcome to a certain extent the unpleasant sensation constantly before me of an injury to a ureter. On account of the wedged-in condition of the tumor mass in the pelvis, the work was trying.

However, after the technical difficulties had been overcome and the enucleation had been started and was fairly well under way, it was accomplished with surprising ease. The tumor was being released very much in the same manner as a finger would be withdrawn from a tight-fitting glove. The bladder attachment offered no obstacle. It was readily separated from the tumor. This was done by gentle rubbing with a gauze sponge, out of respect to the ureters. Posteriorly the peritoneal reflection from the rectum into the tumor necessitated cutting. The remaining attachment was to the vaginal canal and this was severed, completely releasing the growth. There was little bleeding at the bottom of the wound. Peritoneal approximation as good as conditions would permit with vaginal drainage constituted the closing steps of the operation.

It was interesting to note the pressure atrophy that both vagina and rectum suffered. The walls of these organs seemed as thin as tissue-paper. This patient had a stormy convalescence induced by an infection from the vagina. I was very apprehensive of just such a happening. It was almost impossible to subject the vaginal canal to a thorough cleansing. This is one reason, and one that will carry much weight, why tumors growing into the vaginal canal should be removed through this channel. Injury to the pelvic cellular tissue or to the peritoneum can then be avoided and the only traumatism of any consequence will be the laceration of the vagina and the perineum, and that often may be considerable.

DISCUSSION.

The papers of Drs. Erdmann, Gillette and Reder were discussed jointly.

DR. HENRY SCHWARZ, of St. Louis, said that fibromata of the uterus showed themselves in such various aspects that each case must be considered a law unto itself. He did not believe one could lay down an iron-clad rule which would be applicable to every case that might occur. No matter how large one's experience was, in every case of fibroma of the uterus there was the feeling that one might encounter something which was altogether different from anything he had met before. While he admitted that fibroma originating in the broad ligament occurred, because now and then one encountered a small fibroma a great distance from the uterus, and enucleated it, yet he believed that in Dr. Erdmann's cases the tumors originated as interstitial fibromas, gradually working their way either toward one surface or the other. The submucous variety would become detached and give spontaneous birth to the fibrous polyp. The subserous variety would become detached and form new connections in the abdomen, and so while there was a tumor which worked its way between the broad ligament and in the course of time became fully detached, when one found tumors of the size of the ones reported by Dr. Erdmann, it was important to discuss whether they originally developed in the broad ligament, or whether they were interstitial fibroids that were developed along well-known lines.

Dr. Gillette, he thought, should be congratulated on the very beautiful description of the cases he had reported. The speaker had often been puzzled in recognizing fibroids when they complicated pregnancy. What he meant was this: it was well-known that fibroid tumors underwent softening during pregnancy. They sometimes became so soft that they simulated fluctuation to a nicety, and to differentiate between a cyst and a solid tumor was in some cases impossible. To illustrate what he meant, he would say that in February, 1882, a patient was brought into the Lying-in Hospital at Heidelberg with a fluctuating tumor that filled the pelvic cavity. Unsuccessful attempts at version had been made. The rule of putting the woman in the knee-elbow position was followed, trying to push the tumor up, but without success. A trocar was next thrust into the tumor, withdrawing the fluid, but in the meantime the child had died and craniotomy was performed. After delivery the case appeared to be a very simple one. There was a cyst of the broad ligament. The woman died two weeks after delivery from exhaustion.

As to action in cases of fibroid tumors complicating pregnancy he agreed with Dr. Gillette that we could not treat all cases alike. If the tumor was likely to cause obstruction at the time of delivery, the woman should be operated on. If the tumor was of medium size and did not seem likely to cause obstruction

he thought it was well to let it go, because it was remarkable what large tumors sometimes underwent involution after delivery. He recalled two such cases in which the tumors were larger than his fist, which entirely disappeared. He had three cases the year before last of women, about four months pregnant, who presented themselves with fibroid tumors. In one of them the tumor was wedged in below the promontory. It was an interstitial tumor. He took it out. She made an uneventful recovery, and was delivered at term. In the second case he advised the woman to wait, but she had a miscarriage at about six months, and in the course of involution that tumor disappeared entirely. The third case was that of a woman who was delivered in Chicago under great difficulties, but came to St. Louis later and had the tumor removed.

These three cases illustrated very well the point that all of them should not be treated alike. One should always wait, if possible, and see what nature would do for them, provided the tumor or tumors did not seem likely to cause any serious impediment at the time of delivery.

DR. DANIEL H. CRAIG, of Boston, said that if there was the slightest possible doubt as to a fibroid tumor or tumors bringing about complications at the time of delivery, one should operate to remove them. He had seen a number of cases at the Woman's Hospital in Boston in which the fibroid after pregnancy started on its course of involution, and then by the sudden diminution of blood-supply was carried beyond the point of allowing gradual involution to take place and become necrotic. The possibility of this condition should always be borne in mind.

DR. CHARLES L. BONIFIELD, of Cincinnati, had had some experience in operating on intraligamentous fibroids of large size. One case he mentioned last year in discussing this subject, in which it was complicated with pregnancy, and the uterus as it enlarged made such firm pressure on the fibroid that it obstructed the venous flow of blood from the right leg. When he saw the patient, her leg was swollen to twice its natural size. The cervix could not be felt, and the only means of knowing whether the patient was pregnant or not was from the history the woman gave, and her family physician told him that at an earlier period he had elicited manifestations of pregnancy.

The point he desired to make was that the best way to operate on the majority of these cases in his experience was to do supra-vaginal hysterectomy; commencing on the opposite side of the uterus, securing the ovarian and uterine arteries on the side opposite to that from which the tumor sprang first, and then cutting across as advised by Kelly, securing the uterine artery on the other side, and the ovarian artery, if possible, before attempting enucleation; otherwise the hemorrhage was liable to be profuse.

The subject of fibroids complicating pregnancy was one of exceeding interest. Last year, in discussing the subject, he referred to a paper which he read before the Ohio State Medical

Association two or three years ago, in which he reported seven or eight such cases. It was usually stated that fibroids prevented pregnancy. It was a question in his mind whether this was true or not, unless it was a fibroid that was submucous in character and produced a good deal of endometritis. It was a well-known fact that the majority of women who had fibroid tumors were sterile before they got them. As showing how some of these patients were capable of becoming pregnant, he related an experience which he had last summer. The patient was a maiden lady, 35 years of age, who consulted him and in whose case he diagnosticated a large fibroid or two fibroids which extended above the umbilicus. The cervix was pushed high up under the pubic arch. He advised immediate operation, but the woman wanted it delayed. After he returned from his vacation, a few weeks ago, she came to him and said the tumor was growing very rapidly and giving her great discomfort. She told him that there was the possibility of her being pregnant as she had not menstruated for three months. He hardly thought it possible for her to be pregnant; at any rate, if she was, it was no contraindication for the operation, for while the upper tumor extended high in the abdomen, the lower one completely filled the pelvis. She was sent to the hospital. She was found to be three months pregnant. The only thing to do in the case was to make a supravaginal hysterectomy, which was done.

DR. E. GUSTAV ZINKE, of Cincinnati, related a recent experience of fibroid tumors complicating pregnancy. About five years ago he was consulted by a woman who had multiple uterine fibroids. The tumors were so large that the uppermost one was on a level with the umbilicus. He advised the removal of the uterus. The woman declined operation. She was comparatively comfortable, and did not complain, except of a sense of heaviness. She went on, became a widow, having been married twenty years at the time her husband died. She lived in single blessedness for two years and married again. About six weeks after her marriage he was consulted by her, and the tumor showed distinct enlargement, extending probably an inch above the umbilicus. She complained of pressure symptoms, and in examining her a week later he found the tumor had markedly increased in size. By this time she had skipped two menstrual periods, but being forty-eight years of age, and knowing sterility was concomitant with the existence of these tumors, he never thought of the possibility of her being pregnant, and attributed the absence of menstruation to the appearance of the menopause. He advised hysterectomy, as the symptoms increased rapidly, and she submitted to operation. She had eleven fibroid tumors—intramural, submucous, and subperitoneal, and a three month's fetus in the uterine cavity.

DR. GILLETTE, in closing, emphasized the importance of operating on these tumors.

With reference to the disappearance of the fibroid mentioned in his paper, he would not attempt to say that it had entirely

disappeared, but so far as he was able to determine, it had. Of the number of cases of fibroid tumors complicating pregnancy, this was the only one in which the tumor seemed to have diminished materially in size after pregnancy.

DR. CHARLES GREENE CUMSTON, of Boston, read a paper entitled

OVARIAN CYSTOMA COMPLICATING PREGNANCY.*

DISCUSSION.

DR. HENRY SCHWARZ, of St. Louis, thought the members were agreed as to the safety of removal of ovarian tumors during pregnancy, and that they concurred in the points brought out by the essayist. Another reason for operating was that ovarian tumors, if allowed to remain, often gave trouble in the puerperium, as the pedicle was apt to become twisted and operation then had to be done immediately.

DR. EDWARD J. ILL, of Newark, N. J., emphasized the great importance of removing every ovarian tumor that complicated pregnancy. This was a true complication in contradistinction to what had been said with reference to fibroids. While fibroids accompanied pregnancy quite frequently, it was only now and then that they could be considered in the light of a complication.

DR. E. GUSTAV ZINKE, of Cincinnati, Ohio, had recently had two cases of pregnancy advanced to the end of the sixth month complicated with an ovarian tumor. In both instances the patients not only recovered from the operation, but went on to term with the child.

DR. C. C. FREDERICK, of Buffalo, arose to report some of the cases he had seen. If he remembered correctly, he had observed five, although it was hard to recall the exact number. He operated on all of them, three went to term. One case he remembered very vividly from the fact that the woman came to him with edema of the lower extremities; she had dyspnea, with inability to lie down at night, and her general condition was bad. She had some albuminuria. He removed a large ovarian cyst, and four days thereafter, she aborted of twins.

DR. THOMAS B. NOBLE, of Indianapolis, Indiana, in speaking of the removal of an ovarian tumor complicating pregnancy, said the danger to be feared was a sequential abortion. This abortion he believed to be due to two things. One was the nervous disturbance that attended the administration of the anesthetic, the psychic influence, the other the amount of trauma done to the pedicle. The first factor might be entirely eliminated, and the second very much modified by a correct technic applied to the stump. In the two cases reported by the president (Dr. Zinke), it would be recalled that the case in which the ligature was applied was attended with considerable pain. He thought this pain was due in the vast majority of these cases not to constriction of the vessel, or of the nerves so much, as it

*See paper, p. 626.

was due to traction upon the tissues *en masse*. He had many times observed that ligation of tissue *en masse* had been followed in other operations by much suffering, whereas simple ligation of a vessel alone was followed by little or no suffering. In this connection he reported a case of ovariectomy. A woman presented herself with a very large adherent ovarian cystoma, her general condition being such as to preclude the administration of a general anesthetic. Under Schleich's infiltration anesthesia the abdomen was freely opened and without pain; the tumor was dissected from the abdominal viscera to which it was intimately adherent throughout its entirety, particularly in the biliary region and in the pelvis low down on the left side. The woman conversed with him during the operation, and he was able to experiment with reference to the pain elicited and how elicited. She complained of pain after the tumor had been evacuated, dissected, and brought out on to the abdomen, when traction was made upon the pedicle as a whole. But by dissecting the ovarian artery and ligating it, then cutting off the mass, he produced no pain. He had observed this in a number of cases in which celiotomy had been done under local anesthesia, and had observed, too, that it was the general traction upon a multiplicity of nerves that produced pain and not the ligation of single vessels, so that as a suggestion he thought it might be well in this class of cases to use local anesthesia, puncture the cyst through a small opening, remove it, ligate, and drop back with but very little pain, no shock, and possibly with a better prognosis for the continuation of the pregnancy than would occur were the ordinary operation done under a general anesthetic. Under such anesthesia one was necessarily more careful and handled the viscera less. In this way such an insult to the peritoneal cavity would not be inflicted as would be done under general anesthesia.

SUBDIAPHRAGMATIC ABSCESS.

WITH REPORT OF CASES.¹

BY

JOHN W. KEEFE, M.D.,

Providence, R. I.

A SUBDIAPHRAGMATIC abscess is a collection of pus, or pus and gas, which lies in contact with some portion of the under-surface of the diaphragm. It is rarely the result of a traumatism, but is generally due to some previously diseased condition. Subphrenic abscesses occur oftener than we have been led to believe. A careful study of the symptoms and signs of the condition may enable us to save, by surgical interference which is the only rational treatment, a large proportion of the cases.

¹ Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

This subject is one in which this Association may do pioneer work, by the weight of its discussion, calling to the attention of the profession at large, the prevalence of these abscesses, the method of diagnosing them and the proper method of surgical attack.

Other terms used synonymously with subphrenic are hypophrenic, suppurative pyopneumothorax subphrenicus, suppurative perihepatitis, perigastric and suprahepatic abscess. The abscess may be situated on the right or left side and lies either in the greater or lesser peritoneal cavity. The falciform ligament of the liver localizes the abscess, either in the right or left subphrenic region. Subphrenic abscess is usually the result of, or a complication of some pathological condition found in the abdominal viscera, but it may be due to a severe contusion of the chest. The most frequent cause is ulcer, with perforation of the stomach or duodenum. We find extra- and intraperitoneal causes of the abscess. A perinephritic or retrocecal abscess may spread upward or an empyema may perforate the diaphragm and produce a subphrenic abscess. One should bear in mind that a prolonged case of empyema may have a subphrenic origin; as the two conditions are frequently associated. It has been shown that the lymphatics connect the right subphrenic space with the right pleural cavity.

A diseased appendix is often the forerunner of pus beneath the diaphragm. We may have a direct extension along the inner, outer or anterior portion of the ascending colon. The infectious agents may be carried along by the peristaltic action of the colon, through the blood current or the lymph channels. We may have subphrenic abscess due to a diseased appendix, without suppuration in or about the appendix. General peritonitis, due to any cause, may result in the formation of a subphrenic abscess; also suppurating hydatids of the liver or spleen and perforation of the gall-bladder and bile ducts; or rupture of an abscess of the liver. Many cases thought to be abscess of the liver may be perihepatic and a true subdiaphragmatic abscess.

Pus from caries of the ribs may burrow into the subdiaphragmatic space. A subphrenic abscess may perforate the diaphragm and infect the pleural cavity or the pus may enter a bronchus, where the lung has become adherent to the upper portion of the diaphragm. The presence of gas, as well as pus, in the abscess cavity may be due to a communication with some

of the hollow viscera or to the presence of the bacillus aerogenes capsulatus. The pus has a very fetid odor. We may say, generally speaking, that we have a history of some previous abdominal disturbance. The symptoms of the disease which causes the abscess, will be the most prominent ones at the onset. The abscess may develop suddenly or slowly and is frequently mistaken for a pleuritic effusion. When we have symptoms in the lower part of the chest following acute or chronic abdominal disease, we should suspect the presence of a subphrenic abscess. The general condition of the patient is septic. We have pain in the epigastric, hypochondriac and lumbar regions, but the pain may not be only at the site of the trouble as it often extends to the surrounding parts. It may be sharp and pleuritic in character, over the lower part of the right or left chest.

A perihepatitis is usually present, in abscess of the right side and friction râles may be heard over the hepatic region. This is an early sign of extension upward of an inflammatory process. The temperature is irregular, remittent and often high. We may have recurring chills and sweats and there is a leukocytosis present. Depression of the liver and paralysis of the diaphragm may occur early, in the intraperitoneal variety, with lack of movement of the liver during respiration. There may be present slight or well-marked jaundice. We have dullness on percussion in the lower part of the chest, and the area of dullness has been known to extend as high as the second rib and as low as Poupart's ligament. Should gas be present in the abscess, a tympanitic note may be elicited above the liver dullness, and should there also be present a pleuritic effusion, we will have dullness above the tympany. The upper line of dullness is not as well defined as in pleuritic effusion. It is highest in front and lowest behind. Changing the position of the patient does not affect the area of dullness. The movements of the chest are but slightly impaired on the affected side.

A very important sign is the fact that the breath sounds may be heard below the level of dullness, and if deep inspiration be taken, the line at which the breath sounds and vocal resonance are heard and at which vocal fremitus is felt is distinctly lowered. We have exaggerated vesicular breathing above the line of dullness. We may have amphoric breathing below the vesicular murmur, due to the presence of gas.

Cough, expectoration and rapid respiration, with other symptoms of a chest affection are absent. The heart is not

displaced, unless there is also present, a pleuritic effusion or a large abscess on the left side. A radiograph may show the bulging of the diaphragm upward and may be of value in obscure cases. We may have a pleuritic effusion also present, which renders a diagnosis still more difficult in a condition already obscure. Rigidity of the recti muscles in the epigastric region is sometimes found. The affected side is sensitive to the touch along the arch of the ribs and localized edema and bulging may be present. The prognosis with expectant treatment is grave. Early surgical intervention offers the only rational treatment. There were thirteen cases operated upon within three weeks after the onset of the condition, with a mortality of 15.3 per cent., while in eight cases, where operation was delayed longer than three weeks the mortality was 50 per cent.

An opening in the abdomen, in the epigastric region, either through the right or left rectus muscle, will permit us to form a correct conception of the abnormal condition present and the altered position of the viscera. This information will help one to determine the most desirable method of opening and draining the abscess. The aspirator needle is frequently used to determine the presence or the location of the pus in subphrenic abscesses, and I believe great harm thereby has been done. While I would use the needle to aspirate fluid from the pleural cavity, I am fully convinced that it is not wise to employ it below the diaphragm. A proper incision will do no harm and may be the means of accomplishing great good. Pus may be present and the aspiration give negative results. We may fail to reach the abscess or the pus may be so thick that it will not enter the needle. There is a case mentioned by Weir, where the aspirator needle passed through an abscess containing two quarts of pus, and into the liver beyond and nothing but blood was withdrawn. These negative results may delay a needful operation.

The needle may infect a pleural cavity by aspiration of a subphrenic abscess through the transpleural route during the withdrawal of the needle as it passes from the abscess through the diaphragm and across the pleural cavity. The liver may also become infected by the needle after it has passed through an abscess and entered the liver. The aspirator needle has been discarded as an aid in determining the presence of pus in the pelvis and about the appendix, and yet twenty years ago it was a common practice. While I know that many surgeons continue to use the hollow needle to determine the location of pus in sus-

pected subphrenic and liver abscesses, I am certain that it is attended with grave danger to the patient. A few years ago I performed an autopsy twenty-four hours after an exploratory puncture of the liver had been made with an aspirating needle by an eminent surgeon and found the abdominal cavity filled with blood. The bleeding was from a wound in the liver made by the needle, thus causing the death of the patient.

A careful study of the history with all the symptoms and signs will enable us to make a correct diagnosis without introducing the aspirator needle below the diaphragm. These abscesses have been opened and drained in a variety of ways, namely: through the anterior abdominal wall, between the scapula and anterior axillary line, with resection of the ninth and tenth ribs, the diaphragm having been opened below the reflection of the pleura, the incision having been made along the side of the aspirator needle, which has been left in place; by resection of the seventh to the tenth ribs in the mammary line, the opening into the abscess having been made below the diaphragm; by resection of one or two or the lowest costal cartilages; by opening the pleural sac and stitching the costal to the diaphragmatic pleura, previous to opening the abscess by incising the diaphragm; by incision below the twelfth rib; by a combination of the anterior abdominal and axillary thoracic incisions; by incision in the tenth or eleventh interspace, in the posterior axillary line; by incision beneath and following the line of the costal arch; the peritoneum is exposed but not opened, separating the peritoneum from the diaphragm, beyond the adhesions which surround the abscess and then opening the abscess.

When there is no pus in the pleural cavity, drainage of a subphrenic abscess, by what is known as the transpleural route, has never appeared to me to be good surgery. These patients are already septic and show the effects of a severe illness, hence we should not add an acute affection of the pleural cavity to the existing condition. There is no necessity for resection of portions of the ribs in the primary operation, thus adding additional shock to the patient already in a debilitated condition. Should a sinus following intercostal incision fail to close, which I believe will be but rarely seen, we may later resect the ribs at a time when the patient's health will be greatly improved. These abscesses should all be drained by incisions below the diaphragm, but should the case be complicated by the presence of pus in the pleural cavity, drainage of the same should be effected through another incision, made in the seventh or eighth interspace.

Some abscesses may be drained through this incision, while others should be opened in the postaxillary line, in the tenth or eleventh interspace. It will be found necessary to drain the large majority of these abscesses below the costophrenic sinus, in the axillary line, through an incision which permits us to see the structures we are dividing. The liver will frequently be found adherent to the parietal peritoneum, due to a perihepati-

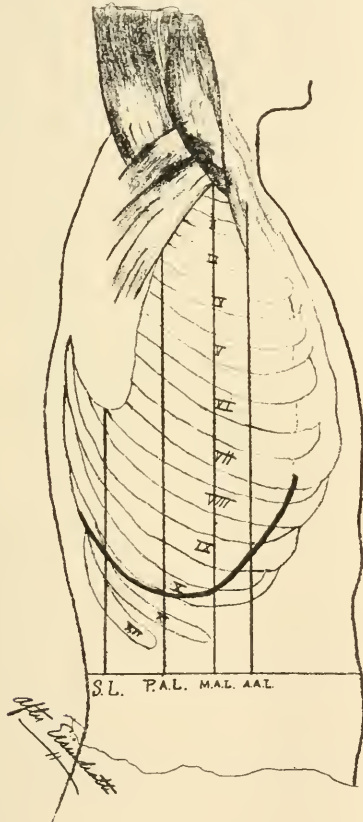


FIG. 1.

tis. Some of these adhesions may be broken up with the fingers to enable us to enter the abscess cavity. There is sufficient room for the introduction of two large drainage-tubes between the ribs. I have for a number of years drained all my empyema cases through intercostal incisions, in both children and adults, with good results and see no valid reason for not employing the same procedure in cases of subphrenic abscess.

CASE I.—E. F. *Appendicitis not recognized; subphrenic abscess; perforation of diaphragm; empyema; abscess drained by median incision and incision in tenth interspace; death.*

Patient was a male, aged forty-six and a German by birth. He gave a history of having had la grippe, followed by pneumonia, twelve years ago and was sick about two months. Three weeks ago, he was taken with colicky pains in the abdomen. A physician was called who thought, at first, that the condition suggested acute appendicitis, but later typhoid fever. A few days later, the patient began to have pains in the right side of the chest, some dyspnea, slight cough and scanty expectoration. Another physician, called in consultation, diagnosed the condition as pleuropneumonia. The patient continued in about the same condition until a week ago, when it was found that his pneumonia was not resolving and that a pleuritic exudate was taking place. Two days ago, he began to have distress in his stomach and an epigastric swelling was noticed. He has perspired freely at night but has had no chills. On his admission to the Rhode Island Hospital, March 15, 1903, the patient was pale and breathed and spoke with difficulty. Over the right lung, dullness began in front at the level of the fourth inter space and extended into the right axilla and back. Posteriorly, there was bronchial breathing, excepting at the base of the lung, where there was an absence of respiratory and voice sounds. Over the upper part of the lung there were numerous fine, moist râles. There were a few moist râles over the lower part of the left lung, in the midaxillary line. The heart was normal.

There was no abdominal distention. In the upper part of the abdomen, on the right side, there was slight rigidity and tenderness on pressure. A mass continuous with the liver and extending one inch below the umbilicus could be felt. The mass disappeared at the left side beneath the free border of the ribs. In the epigastrium, there was a distinctly visible mass, which felt soft and which gave a tympanitic note on percussion. The patient's temperature was 100.4° , respiration 30 and pulse 130. His leukocyte count was 14,000. The urine was acid, 1022 sp. gr., contained very slight trace of albumin, a few hyaline casts, leukocytes, calcium oxalate crystals and epithelium.

The following day, March 16, under oxygen-chloroform anesthesia, a vertical incision was made over the right rectus muscle, extending from the costal border of the ribs to the umbilicus. On going through the muscular layer, an abscess

was opened, which contained a large amount of foul, purulent fluid, necrotic slough and gas. The cavity was irrigated with saline solution, washing out what appeared to be a fecal concretion. The cavity extended upward anterior to the peritoneum, into the right pleural cavity, through an opening in the front portion of the diaphragm. The lung above was adherent to the pleura. A probe was inserted eight inches through the opening in the diaphragm. On the left the abscess passed beneath the free border of the ribs.

Thoracotomy was done in the axillary line between the sixth and seventh ribs and some pus and sanguineous fluid evacuated. A rubber drainage-tube was inserted between the ribs into the

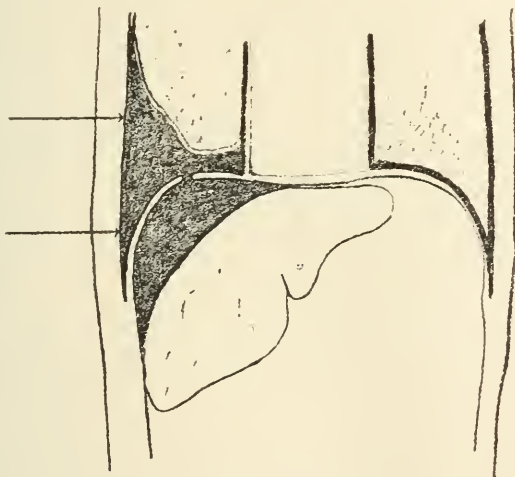


FIG. 2. CASE I AND CASE III.

pleural cavity and iodoform wicks inserted through the abdominal incision in radiating directions. The abdominal incision was partially closed by layer suture of chromic catgut. The patient's condition at the end of the operation was fair. On the day following the operation the patient's dyspnea increased, until by the evening he was in great distress. His strength failed and he died on the same night. Autopsy report follows.

Autopsy twelve hours postmortem, March 18, by Dr. Fulton.

Anatomical diagnosis:

Acute ulcerative appendicitis with perforation.

Retroperitoneal abscess extending into right pleural cavity.

Operation wound in abdominal wall and in right thorax.

Acute bronchopneumonia.

Edema of lungs.

Acute fibrinous pleurisy (right side).

Slight arteriosclerosis.

Fatty degeneration of the kidneys.

Fatty infiltration of the liver.

Body of a well developed and well nourished man. Body length 159 cm. No edema. Rigor mortis moderate. Slight lividity in dependent parts of the body. Pupils equal and moderately dilated. Operation wound, in abdominal wall, 13 cm. in length, $4\frac{1}{2}$ cm. to the right of the median line, the lower end about on the level of the umbilicus. This is packed with iodoform gauze. Second operation wound about 8 cm. in length following the seventh intercostal space, situated almost directly below the axilla. This contains two pieces of rubber tubing, which extend into the pleural cavity. The greater part of the peritoneal cavity is perfectly smooth and normal. There are no adhesions and no inflammation of the coils of the small intestines. There is a large abscess cavity into which the abdominal incision leads, extending from within about 2 cm. of the level of the umbilicus upward underneath the border of the ribs. This extends about to the median line and well over into the right hypochondrium. This cavity is directly over the liver and is separated from it by the diaphragm and the parietal peritoneum. This abscess cavity is entirely shut off from the peritoneal cavity.

The appendix lies behind and to the outer side of the cecum and extends upward for the first 5 cm. of its length. It is practically normal except that it is covered in by adhesions of the overlying cecum. The distal $3\frac{1}{2}$ cm. of the appendix is about half ulcerated away, so that the lumen for that distance is entirely open. Right at the tip of the appendix is a large abscess cavity, in the lumbar region just below the border of the ribs and above the crest of the ilium. It involves practically all the retroperitoneal tissue in this region. The tissues here are greenish-gray in color, much infiltrated and almost entirely necrotic. This abscess cavity is filled with a grayish-black, granular, fibrinopurulent fluid, in which there are numerous, large, shaggy flakes of fibrin. Leading from this cavity upward through the retroperitoneal tissue is a sinus which varies from 3 to 6 cm. in width. This sinus burrows back of the posterior attachment of the diaphragm upward and forward opening into

the pleural cavity in the region of the operation wound in the seventh interspace. By separating the adhesions in this region, the finger can be easily passed from this sinus downward and forward over the diaphragm in region of the liver where the burrowing material has separated the diaphragm from its anterior attachment to the right and also the peritoneum from the anterior abdominal wall. This is the region of the location of the abscess, into which the first-mentioned operation wound opens. There is considerable greenish discoloration of the tissues all about this burrowing, infiltrating abscess cavity and sinus.

The right lung is very much collapsed and the lower surface of the lower lobe is covered by a thick fibrinous exudate. This also extends up over a considerable part of the lateral and posterior surface of the lower lobe. There are numerous thick adhesions in the lower part of the pleural cavity, but these are rather easily separated. There are no adhesions in the peritoneal cavity, except adhesions in the tissue neighboring this abscess cavity. The small intestine, the transverse and descending colons are all easily removed. The ascending colon is everywhere adherent to the burrowing sinus and abscess back of it. There are some comparatively light adhesions about the gall-bladder, and the undersurface of the liver. Pericardium is normal. Heart weighs 300 gms. The muscle is brownish-red, but rather soft and flabby. Valves are normal.

Left lung is very voluminous, being approximately twice the size of the right. There is, however, very little difference in weight, the left weighing 630 while the right weighs 550 gms. The left is tolerably soft and crepitant throughout and on section presents a grayish-red, slightly irregular, nodulated surface, from which there exudes a large amount of slightly blood-tinged serum. The right lung is very much collapsed. On section it is very dark red and is much less crepitant than normal. There are no areas of solidification, nor is there any evidence of any involvement of the lung tissue itself in the abscess. Aside from the points mentioned, the intestines are normal. Spleen weighs 160 gms. It is smooth and regular in shape. Cut surface is rather pale red and the markings indistinct. Consistence is not remarkable.

Stomach contains two ulcerated areas, both of them situated within 5 cm. of the pyloric valve. One of them is much elongated, measuring 5 x 1 cm. It has well-defined, abrupt, precipitous edges and a fairly smooth base. The edges are not particularly

elevated or thickened. It is from 1 to 2 mm. in depth. The other area is about $2\frac{1}{2}$ x 8 cm., is well-defined in outline, edges not thickened or elevated. Its base is slightly pigmented and depressed about 1 mm.

Pancreas is normal. Liver weighs 1740 gms. It is extremely pale yellow. It is, however, smooth and regular in shape. On section the markings are very indistinct and the cut surface is very pale yellow. The portal vessels are perfectly smooth and show no evidence of involvement. Gall-bladder and bile passages are normal. Kidney weighs 300 gms. There is some injection of the cortex of the right kidney near its lower extremity where it comes in contact with the abscess cavity, but there is no real extension of the abscess itself into the kidney substance. Aside from this point, the two organs are not essentially different. The striation of the pyramids are fairly well marked, but the markings of the cortex are indistinct, the cortex being unusually pale. Capsule strips easily from a smooth pale surface. Adrenals are not remarkable. Bladder and genitalia are normal. Aorta shows numerous, small, irregular, bright yellow areas of thickening of the intima.

CASE II.—T. S. *Gangrenous appendix with abscess, appendectomy; drainage; subphrenic abscess; perforated diaphragm and bronchus; empyema; drained in ninth interspace; recovery.*

The patient was a young man, aged seventeen years, a student and single. Four days ago, he was taken with severe pains in the right iliac region. Had some tenderness over the painful area. The following morning he was nauseated and vomited. The pain and tenderness in the iliac region persisted and, with the vomiting, has continued every day up to the present.

An examination showed the heart and lungs to be normal. The abdomen was distended and the muscles were rigid over both sides. There was considerable tenderness on pressure over McBurney's point. The percussion note was dull in this region, being more dull posteriorly than anteriorly. No mass could be felt. The left side was tympanitic on percussion. A diagnosis of appendicitis was made.

Operation. Ether. On opening the peritoneum, free serum escaped. The appendix was freed and removed with the angiotribe and the stump ligated and inverted, with a purse-string suture. The fossa was drained with two cigarette drains and the wound closed in layers around them. At the end of the operation the patient's condition was good. The wound was dressed in

forty-eight hours. Two days later the temperature still remained up. Some fecal discharge from the wound was noticed. Over the right chest posteriorly, below the scapula, dullness was noticed.

On January 30, five days later, the patient coughed and brought up about a pint of pus, presumably from the lungs. The following day, the patient's temperature was 104° , and he was still coughing up pus. On February 5 the right chest was aspirated and pus obtained. Thoracotomy was done, a considerable amount of pus being evacuated and a rubber drainage-tube was inserted.

On February 7 the fecal fistula had closed, but there was still profuse drainage from the thoracotomy wound. On February

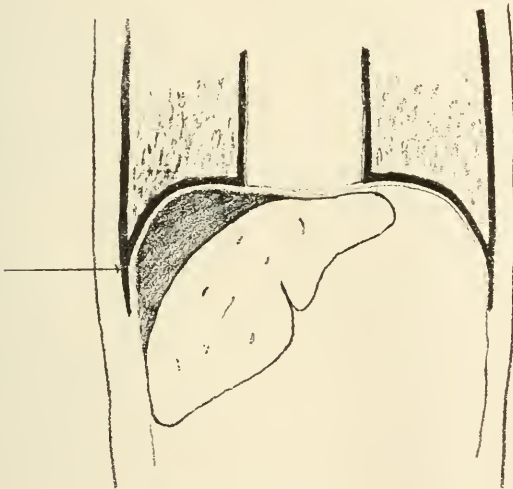


FIG. 3. CASE II.

21 fecal matter was found coming from the wound in the chest. His sputum was examined for tubercle bacilli, but none was found. The patient began to improve gradually, and by March 24 he was out of doors and his temperature was normal. The tube was left out of the chest wound on the 31st of March. The patient left the hospital, April 14, cured.

CASE III.—R. L. K. *Gangrenous appendix; appendectomy; drainage; subdiaphragmatic abscess; empyema; drainage eighth interspace; ruptured into bronchus; death.*

The patient was a male, nineteen years old, white, single and a clerk by occupation. His family history and past history are negative. His present trouble began November 22, 1906, im-

mediately following lunch, with severe cramps in the whole lower part of the abdomen. The bowels moved freely a number of times during the afternoon. Patient also vomited several times. The condition was diagnosed by his physician as acute intestinal indigestion. He continued much the same until the morning of the patient's admission to the hospital, November 27, 1906. On that morning the abdominal pain became much worse and the vomiting has been frequent for the past twenty-four hours.

Physical Examination.—The abdomen was considerably distended, the recti muscles were rigid and there was general tenderness, more marked over the appendix region. There was free fluid in the flanks. The temperature was 103° , pulse 116 and respiration 28. The leukocyte count was 17,400.

At operation an incision was made over the appendix and free fluid escaped, a culture of which subsequently showed colon bacilli and streptococci to be present. The appendix was swollen, friable, gangrenous and covered with exudate. The appendix was removed, the stump ligated and inverted by a circular suture of fine Pagenstecher thread and two cigarette drains inserted.

The patient did well for four or five days following the operation, although his temperature remained around 100° . The wound drained freely, the drains were removed in thirty-six hours and new ones inserted. About ten days after the operation the patient's temperature became septic in character, running from normal to 102° , he began to have great thirst and restlessness at night. The bowels became loose, the stools were green and watery, and micturition became frequent. The pulse was poor¹ in quality, and at times the patient was delirious. He developed a slight cough with labored and frequent respiration. On December 13 there was dullness over the right chest extending up nearly to the nipple. The breath sounds were decreased and there were a few moist râles on inspiration. The leukocyte count was 9200. Two days later the dullness in the chest had extended up to the nipple, the breath sounds and voice sounds were very much decreased. The leukocyte count was 11,400. The chest was explored with an aspirating needle and pus found. A thoracotomy was done in the eighth interspace and considerable pus evacuated. Rubber-tube drains were inserted. The chest wound discharged very profusely, but the pulse continued to grow worse and the breathing

continued labored. The patient was very weak and delirious. He gradually failed and died December 25, 1906.

Pathological Report. R. L. K.:

Macroscopical Appearance.—Specimen consisted of a mutilated appendix and fecal concretion about 1 cm. in diameter. The appendix was in two parts, the wall was thin, the outer surface ragged and the mucosa not especially remarkable. Over part of its extent the wall is partially destroyed and the outer surface is covered with a greenish exudate. The mucosa and greater part of the wall in this part is necrotic and greenish in color.

Microscopical Appearance.—The mucosa of the wall of the appendix is entirely gone and its place occupied by leukocytes and necrotic tissue. The wall is infiltrated with leukocytes and there is a layer of exudate consisting of leukocytes and fibrin on the outer surface. Diagnosis: acute ulcerative appendicitis.

CASE IV.—F. G. *Subphrenic abscess; incision right rectus to locate abscess; second incision in eleventh interspace; abscess drained; recovery.*

This patient, an Italian, aged forty years, a laborer by occupation, was admitted to the medical service, Rhode Island Hospital, November 21, 1907, giving the following history: twenty-one years ago, he was sick, for one month, with cough and bloody expectoration, pain in the right side of the chest and fever. He has been in this country for the last six years.

During September, 1907, patient suffered with a diarrhea, which lasted the entire month. He had five or six small movements a day containing blood and being accompanied by tenesmus and colicky pain in the abdomen. In October he began to have pain in the right side of the abdomen below the free margin of the ribs, where it has remained ever since. The pain has been constant, aching in character and radiating to the back, right shoulder and across the abdomen. It is made worse by coughing and deep breathing. There is no vomiting, eating does not aggravate the pain. There has never been any jaundice or urinary symptoms. He has had a slight cough, with a small amount of whitish sputum, frequent severe night-sweats and slight shortness of breath. He has lost considerable strength, but only five or six pounds in weight.

On examination, the patient had dullness and absence of breath sounds below the lower angle of the right scapula. The liver was enlarged and tender. The temperature ran from 99° to 100°. The leukocyte count was 8900. An x-ray plate showed

faint cloudiness at the base of the right lung. An exploratory puncture in the fifth space, anterior axillary line, was negative. At the patient's own request, he was discharged December 5, 1907, without a diagnosis being made.

On February 4, 1908, the patient reentered the hospital, on the medical service. He looked poorly nourished and considerably under weight. The chest was somewhat barrel-shaped. The right half below the nipple appeared distinctly larger than the left and measured from midsternal line to vertebral line an inch and a half more. The movements on the right side were more restricted and superficial, the veins more prominent. There was tenderness on pressure and percussion over the

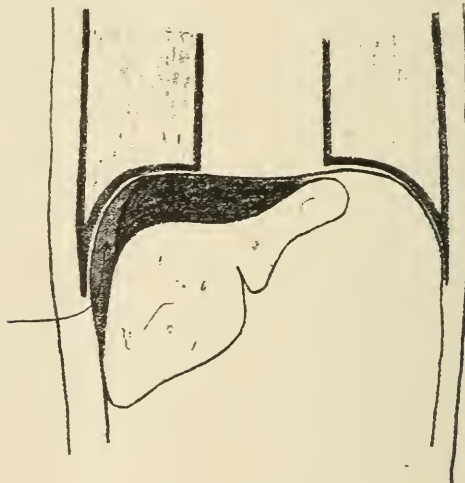


FIG. 4. CASE IV.

enlarged area. There was dullness extending downward into flatness on the right side, below a line extending through the right nipple and middle of right scapula. The vocal fremitus was not diminished, the breath sounds were absent and there were no râles. There was slight dullness at the left apex. The liver was very easily palpable about an inch and a half below the free margin of the ribs. The edge was smooth and tender on pressure. No masses could be felt. The patient's chest was explored with a needle in the eighth intercostal space with a negative result.

The patient was transferred to the surgical service and after examination, February 11, a diagnosis of subphrenic abscess

was made and operation was decided upon. An incision was made through the upper part of the right rectus muscle. The liver was found enlarged and congested, with adhesions about it, to the parietal peritoneum. A fullness was felt above the liver, between it and the diaphragm, which showed us the location of the abscess. The edges of the abdominal incision were clamped together and a second incision made in the tenth intercostal space, midaxillary line. The subphrenic sinus was opened and a small amount of serum found in it. This opening was packed with gauze and an abscess, which was found below the diaphragm and over the liver, was opened and drained. The abscess contained fully a pint and a half of odorless pus. A large drainage-tube was inserted and the incision closed about it with silkworm gut. The abdominal incision was closed in layers. The patient at the end of the operation was in good condition.

Following the operation, the wound drained profusely, but the patient's temperature remained irregular. He complained occasionally of pain, pleuritic in character, in the right side. Dullness over the right side still persisted.

On March 2 a troublesome diarrhea set in. Four days later an exploratory puncture was made in the seventh right intercostal space, posterior axillary line, but no fluid was obtained.

On the morning of March 7 he began to cough violently and expectorated a large amount of purulent material. His pain was relieved, his temperature dropped to normal and remained so all day. For one week the patient continued to raise large amounts of purulent sputum. The temperature steadily remained normal. The discharge from the subphrenic abscess gradually diminished in amount. The patient was discharged April 15, feeling perfectly well and requiring dressing only every other day. The chest still showed some dullness and diminished breath sounds at the base of the right lung, but there was no cough or expectoration. One month later the patient was perfectly well.

CASE V.—F. W. *Subdiaphragmatic abscess; probable perforating duodenal ulcer; incision eleventh intercostal space; recovery.*

The patient was a German, forty-nine years old, married and an assistant manager of a theater. His family history is negative. Four years ago he had an attack of acute inflammatory rheumatism in right ankle and knee, which incapacitated him for four weeks. Two years ago he was thought to have had typhoid fever and made a good recovery. On the twenty-ninth of last April

he was again taken sick with acute rheumatism, involving the left ankle. He was ill about one week this time.

On May 31 he had a third attack of rheumatism, confined to the right ankle at first, then passing to right knee and shoulder successively. He recovered from this attack and was out in about one week. Four days later, on June 10, he was taken with considerable pain in the lumbar region over the right kidney. There was moderate tenderness over the kidney on pressure, but because of the man's size the kidney could not be palpated. The pain was aggravated by any muscular exertion. Nothing abnormal in the chest could be found at this time. The pain and tenderness persisted and on the second day after the onset the patient

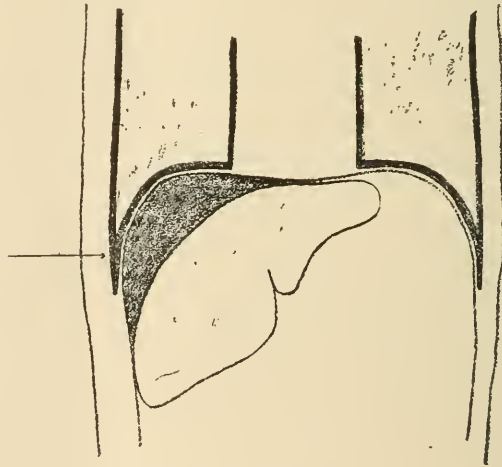


FIG. 5. CASE V.

was obliged to go to bed. He began also to run a temperature of 99° to 105° . Repeated examination of the urine showed only a few red blood-cells, leukocytes and epithelial cells. After a day or two in bed, the acute arthritis reappeared in the right ankle and knee. The pain and tenderness in the right lumbar region gradually subsided with rest, but in four or five days it reappeared this time also being in about the eighth and ninth costal interspace along the posterior axillary line. On auscultation, a few dry râles could be heard in this region. Later the râles became moist, and gradually dullness appeared over the right chest, extending up to a line drawn through the

nipple and inferior angle of the right scapula. Over this area vocal fremitus and the voice and breath sounds were diminished. Above the line there was hyperresonance, with exaggerated voice and breath sounds.

On June 16 the leukocyte count was 17,500. On this day the right chest was explored with an aspirating needle, but no fluid was obtained. A diagnosis of subdiaphragmatic abscess was made and the patient sent to the hospital.

On June 20 an incision was made in the eleventh interspace posterior axillary line. The upper pole of the kidney and peripheral tissues were normal. Dissecting up behind the peritoneum, with the finger posterior to the liver, the peritoneum was punctured and a pint of thin, foul pus was evacuated. A large rubber drainage-tube was inserted and the skin incision partially closed with silkworm-gut sutures. The abscess drained profusely for several weeks. There was absorption enough to give the patient a septic temperature. As the abscess contracted the discharge lessened, the temperature dropped and the patient gradually recovered.

CASE VI.—C. A. O. *Subdiaphragmatic abscess; incision eleventh interspace below costophrenic sinus on right side through attachment of diaphragm into abscess; death.*

Patient was a male, twenty-three years of age, white, single and a teamster by occupation. One brother had died of pulmonary tuberculosis. Patient's previous health had been good. Two weeks ago he began to have chills followed by fever, which caused him to go to bed. He had cramp-like, intermittent pain in the region of the stomach, more severe possibly on the left side. He had some nausea, without vomiting, and some vertigo. The pain has constantly increased in severity since its onset. The patient feels lame, very weak and exhausted. On admission to the hospital, July 2, 1908, his temperature was 102°, pulse 90 and respiration 25.

Physical Examination.—Over the right side of the chest there was dullness, extending up to the right nipple. The breath sounds and voice sounds over this area were very faint. There were a few coarse râles. Vocal fremitus was decreased. Above the nipple line front and back there was hyperresonance with exaggerated breath and voice sounds. Vocal fremitus was increased also. There was fullness over part of the right chest. The abdomen was considerably distended. The recti muscles were rigid. The lower border of the liver extended about one

inch below the free margin of the ribs and was tender on pressure. The spleen was slightly enlarged.

On July 3 an incision, under cocaine anesthesia, was made in the posterior axillary line in the eleventh interspace by my colleague Dr. W. Keen. The incision was carried directly into the liver substance, as that organ was adherent to the lateral abdominal wall. The line of adhesions formed by perihepatitis were broken down over the dome of the liver toward the median line of the abdomen and a pint and a half of thick, foul pus was evacuated. Two large rubber drainage-tubes were inserted into the abscess cavity and the skin incision partially closed with silkworm-gut sutures. At the end of the operation the patient was in a state of considerable shock. Saline solution was given under the skin by hypodermoclysis and by continuous drip by rectum. Patient continued to fail, and died six hours after operation.

The main facts which I wish to emphasize are: The avoidance of the transpleural route; the dangers in the use of the aspirator needle and the unnecessary resection of the ribs; the advocacy of exploratory abdominal incision, with drainage through the same or in the tenth or eleventh interspace in the postaxillary line.

259 BENEFIT STREET.

DISCUSSION.

DR. CHARLES L. BONIFIELD, of Cincinnati, recalled two cases of subphrenic abscesses. The first occurred in a boy, ten years of age, who had an attack of appendicitis. He saw this case between fifteen and twenty years ago. The attack of appendicitis was typical; the boy was not operated on; he went on for two weeks apparently convalescing nicely, when suddenly his temperature rose and the symptoms became aggravated. He had chills and seemed to be in a bad condition. The only physical symptoms were an increased area of dullness over the liver. They were watching and waiting, and one night the boy coughed up about a pint of pus, making a good recovery. There was no question in his mind that the pus came from an abscess under the diaphragm which had ruptured into a bronchus, after which the patient got along nicely. He was now a healthy man and to his knowledge had not been operated on for appendicitis.

The other case he saw two or three years ago at Hillsboro, Ohio. This patient gave a history of infection of the gall-bladder and bile ducts. The area of liver dullness was greatly increased, and he opened the abdomen for exploratory purposes. His finger slipped into an abscess cavity below the liver, from which was removed three pints of pus. The condition of the patient

was bad. He put in a large drainage tube, and the patient made a slow but complete recovery without any other treatment.

One point made by the essayist was of great value, namely, that the aspirator was of no use below the diaphragm unless the abdomen had been already opened with a knife.

Many years ago he saw a case in consultation with a professional friend in Kentucky. In this case both of them made a diagnosis of abscess of liver. At that time it was thought pus could be aspirated before opening the liver with knife or cautery. At the speaker's suggestion, the physician introduced an aspirating needle two or three times at different places, and was unable to get any pus. He (Dr. Bonifield) tried it four or five times, and finally gave it up, although they were reasonably sure the man had an abscess of the liver. Three days later the man died, and autopsy showed that they had passed the needle on every side of the abscess. This case showed the futility of using an aspirator as a means of diagnosis in abdominal conditions.

DR. ALBERT GOLDSPOHN, of Chicago, said there was no doubt that all of the Fellows had opened abscesses in the lumbar region which on their interior upper wall reached to the diaphragm. He had done this in a number of instances in years gone by, but had forgotten the details of the cases. Most of these abscesses undoubtedly came from the appendix originally. He recalled an interesting case of the kind very vividly that came under his observation two years ago. The patient, a farmer, had appendicitis, and was treated by his family physician medically. The patient had chosen medical treatment until he developed an abscess or a large swelling in the right loin that pointed, and then the physician took a bistoury, punctured it, and let out a quantity of pus. While the patient was temporarily improved by this procedure, he never fully recovered; a sinus kept discharging a little for many months, until the patient was sent to Chicago and fell into the hands of the speaker. The sinus was followed and traced to the region of the right kidney, and when the entire tract had been explored he found quite a characteristic, well-formed fecal stone, lying in immediate proximity to the right kidney. After exploring this cavity, cleaning it out, packing it thoroughly, and preparing for clean work, he made an incision over the region of the appendix and found a healthy appendix. Drainage was established, and the patient recovered.

Recently another neglected case of a different form came under his observation. A boy, ten years of age, evidently had a tubercular pleurisy, with an exudate that became purulent, on the right side, which infected the subdiaphragmatic space by perforation, and then pointed in the right loin. In this case it was the ignorance of the parents that caused the boy to be neglected. When the abscess looked as though it would rupture, the doctor introduced a bistoury, made little holes, and a lot of pus escaped. The patient, however, did not improve, and when he was extremely reduced the parents were willing that something else

should be done. Dr. Goldspohn followed these sinuses from these apertures as a guide, got up within the eleventh and tenth ribs, just below the attachment of the diaphragm to the eleventh rib, and found a cavity that reached above the liver inward a distance of four or five inches, so far as he could reach with the finger, after he had enlarged the incision by the resection of the rib. As there were signs of empyema, he entered the thorax, then connected the pleural abscess cavity with the subdiaphragmatic abscess cavity and drained both. The boy improved, but as the cause was tubercular, the outcome was uncertain.

He could not agree with the essayist as regards avoiding resection of the rib or ribs in draining an empyema. If one forced large drainage tubes through the ordinary intercostal space, he would hurt the patient by the dressings thereafter. The apertures of these drainage tubes would become clogged with granulations, and it would be necessary to turn the tubes and this would torture the patient. The speaker would very much prefer to resect a rib and empty the contents of the abscess in a comfortable manner to the patient.

DR. I. S. STONE, of Washington, D. C., (by invitation) thought the most interesting point brought out had been with reference to abscess which followed appendicitis. It occurred to him that this was very much like an extension of an abnormal process, or of suppuration which was common elsewhere. There was a limitation of the suppurative process at the diaphragm simply because the diaphragm offered strenuous opposition to the further advance of the suppurative process. At the diaphragm pus would form and after a long time perforation would take place. We might get an empyema, but often we would get perforation into a bronchial tube. It had been his misfortune to see such cases. If the abscess stopped temporarily at the diaphragm or remained there, it was a subphrenic abscess; but if the abscess began at the appendix, and finally extended and ruptured into a bronchus, it could not be called a subphrenic abscess. But it was one that had its origin from the appendix and should be called an appendiceal abscess, its opening being into a bronchus.

DR. HERMAN E. HAYD, of Buffalo, New York, had been surprised to find how frequently this complication took place in connection with suppurative diseases, particularly of the appendix, the gall-bladder, and of the stomach.

He related the case of a boy, eleven years of age, upon whom he operated some years ago for an acute gangrenous appendicitis, with localized abscess. He opened the abscess cavity, drained, washed out with peroxide of hydrogen, broke up adhesions, and removed the appendix. The boy did nicely. About the eighth day he complained of some pain in his side, and in the course of two or three days ran a temperature; his pulse became materially accelerated; he was quite septic, and it was thought he had an empyema. The chest was aspirated and a quantity of dirty, foul-smelling pus escaped. He removed from the anterior axil-

lary space a piece of rib about an inch in length, and drained the empyema. The boy did well for two or three days. Then it was evident from the elevation of temperature that there was still infection. He examined him carefully, and made up his mind that there was pus below the diaphragm. The boy was put on the table again, given chloroform as an anesthetic, and a subphrenic abscess was opened which was found to contain foul-smelling pus. In washing the cavity out below the diaphragm, fluid came through the pleural cavity, showing that the diaphragm had been punctured, and a communication existed between the abscess below the diaphragm and the abscess above the diaphragm. This case suggested the frequent association of subdiaphragmatic abscess with collections of pus in the pleura, and had led him to ask whether the process was not really one of direct extension from the lymphatics, below, up through the diaphragm into the pleural cavity.

DR. HAYD related another case of subdiaphragmatic abscess in a woman, 26 years of age.

DR. MILES F. PORTER, of Fort Wayne, Indiana, said the point should be emphasized that subdiaphragmatic abscess or abscesses were secondary conditions. They meant primary trouble in the vast majority of cases either in the lungs above or the belly below; and therefore, they originated on the right side very much more frequently than they did upon the left, for the reason that on the right side, leading directly under the liver, by easy methods of accumulation we had the gall-bladder, the gall-duct, the ulcer-bearing area of the stomach, the duodenum, and the appendix. But in perforations of the stomach, on the other hand, particularly of the posterior wall, opening into the lesser cavity of the duodenum, not infrequently an abscess would manifest itself first upon the left rather than upon the right side.

Another point of practical importance, and one worthy of emphasis, in connection with the paper, was the importance of fecal concretion as compared to the appendix itself in operations upon abscesses or conditions resulting from appendicitis. Much has been said with reference to the importance of removing the appendix. The speaker had seen a great proportion of appendiceal abscesses kept up by fecal concretions outside of the appendix.

Concerning the question of resection of a rib or ribs, this was to be decided by the man who did the operation. A timely operation for empyema did not need a resection of the rib. All one wanted was a large enough opening to drain the cavity thoroughly and sufficiently early before there was a thick pleura. This was all that was necessary. The average rib space would allow the introduction of the finger without any trouble.

The employment of the aspirator as a means of diagnosis of pathological conditions below the diaphragm was of doubtful value.

DR. JOSEPH A. HALL, of Cincinnati, Ohio, related the case of a

man, 45 years of age, who was brought to him from West Virginia, with a strangulated hernia. The history showed that he had had a right inguinal hernia for fourteen years, and had worn a truss. About two weeks before coming to him the hernia became strangulated, and for five days the patient had fecal vomiting. He was operated on as quickly as possible, and it was found that six or seven inches of the gut had sloughed away.

An anastomosis was made with the Murphy button, and on the fourth day the button passed. On the eighth day the patient complained of a severe pain in the left side under the ribs. A little later in the day he developed incessant cough. His temperature was 102° ; pulse 130. There was profuse perspiration. His father (Dr. Rufus B. Hall) suggested pus, but they could not find just where it was. Dr. Joseph Eichberg, who was called in consultation, suggested pneumonia. The man steadily declined. At the suggestion of the consultants the speaker aspirated, but was unable to get anything. The aspiration, however, established free drainage. Quite a little foul-smelling serum escaped through the opening. The next morning, about three o'clock, the speaker was called by telephone, and instead of being informed that the patient was dead, as he had expected, to his great satisfaction and relief was told that the man had evacuated nearly a quart of pus by the mouth.

DR. ELLIS W. HEDGES, of Plainfield, New Jersey, related the case of a young woman, twenty years of age, whom he saw about two months ago. She was brought to the hospital with a diagnosis of suppurative appendicitis, in which rupture had taken place. On opening the abdomen fully a pint of pus came out; drainage was established, and patient did well for two weeks, when dysentery occurred, which nearly killed her. This continued for two weeks before it was entirely controlled. Then the patient did well for a few days, in that fever subsided, and it was thought she was going to recover. Within four weeks from the time she was brought in, she complained of severe pain in the right side of the chest. The region of the lower ribs in the axillary line was sensitive to touch. There was no cough.

Examination of the lungs failed to show anything. He waited for something to develop and failing to find introduced an aspirator into the pleural cavity, thinking he would be able to find pus there, but this disclosed nothing. He then aspirated above the liver, but all of the punctures were fruitless. Pain and septic symptoms continued. He could find no fullness or bulging on that side anywhere between the ribs; no edema; no cough to tell where to go in. He felt sure, however, that he had a subdiaphragmatic abscess to deal with. After getting the patient in a certain position on the operating table, he noticed a slight bulging on the back in the eighth or ninth interspace, about three inches from the spine of the vertebra. An incision was made here and nearly a pint of stinking pus was let out. The patient recovered.

DR. FRANCIS REDER, of St. Louis, spoke of a patient who had a subphrenic abscess on the left side, the origin of which was a carcinoma of the splenic flexure of the colon.

He was somewhat surprised to hear that empyema did not require resection of a rib or ribs. His experience had been that it was not easy to determine when in empyema, acute or chronic, resection was indicated. Sometimes he resected one rib, sometimes two ribs, in order to get proper drainage. The transperitoneal route was not the one by which to attack a subphrenic abscess. These abscesses were obscure, and puzzling at times; they were the sequelæ of primary affections elsewhere.

DR. KEEFE, in closing the discussion, laid great stress on the fact that abscess was not a disease *per se*, but was due to some diseased condition; nevertheless, it was necessary to call it a pelvic abscess, an appendiceal abscess, or a subdiaphragmatic abscess according to location. It was exceedingly difficult to find where such an abscess originated. In some of the cases it was not known whether the abscess was due to an ulcer of the stomach or to a perforation of the duodenum. Many cases operated on for ulcer of the stomach and called such were now designated as ulcer of the duodenum. One could have a subdiaphragmatic abscess due to a diseased appendix. The sinus through which infection passed might be closed and an abscess result, a condition not frequently recognized. A rib or ribs could not be resected in a few minutes; therefore, resection of ribs should only be done where it was thought to be absolutely necessary. Patients with subdiaphragmatic abscess were in such a septic condition usually that adding the resection of a rib or ribs to the operation might kill them.

(To be concluded.)

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

FEVERS OF INTESTINAL ORIGIN IN CHILDREN.*

BY

ELIAS H. BARTLEY, M. D.,
Brooklyn, New York.

THE intestinal mucous membrane in infants and young children is peculiarly sensitive to irritants and infections. We are all familiar with the vomiting, pain, fever and extreme nervous disturbance often observed as the result of eating food unsuited to the age of the child—food which would create no uneasiness in an older child or an adult. This may disappear completely on removing the irritant by emptying the stomach and intestine. We believe that in most such cases, at least, there is no toxin absorbed. If the irritant be not removed, the symptoms remain until a true inflammation and permanent fever result. A solid, indigestible, non-putrescible substance may produce fever not of toxic, but of reflex origin.

We also know that in these young subjects putrescent or decomposing foods will very often produce symptoms similar to those above described as caused by solid, indigestible, nonputrescible foods. For example, sour milk at times, stale milk, stale meat broths, stale fish, etc. Here we assume one of two explanations of the irritation or inflammation—either that it is due to the irritant nature of the mixture with its organisms, or to the more remote effects of dissolved decomposition products after absorption, or possibly both of these acting together. If vomiting occurs within an hour or two after the ingestion of the food, the symptoms may and usually do entirely subside without permanent injury. If, however, several hours elapse, the symptoms do not rapidly subside on emptying out the canal, even if lavage and colonic irrigation, followed by catharsis, be employed. The fever and nervous disturbances continue with sometimes such symptoms as strabismus, numbness or partial paralysis of certain groups of muscles, urticaria, delirium, disturbances of circulation

* Read before the Brooklyn Medical Society, September 18, 1908.

and so on. There will often be found in the urine certain substances produced in the intestine.

The character and severity of the symptoms vary with the time of the retention of the irritating substance and the nature of the substance. When the symptoms are persistent and characteristic and the contact longer, we can only explain the above symptoms by the assumption of absorbed poisonous substances. Moreover, in some cases the symptoms are so persistent and continue either in the acute or chronic form so long after the local or intestinal symptoms have entirely disappeared, that we can be certain that permanent injury has been done to the remote organs.

Cases that go to autopsy, according to Fischl, always show changes in the epithelium of the intestine and in the kidneys. The kidneys are swollen and pale in color with injected glomeruli; the pyramids are very hyperemic.

Kempner and several other observers in animal experiments with the toxin of meat-poison have found degenerative changes in the cells of the spinal cord similar to those produced by the toxin of diphtheria.

These degenerations explain the persistency of certain symptoms after such attacks.

There are also cases of chronic intestinal indigestion or chronic intestinal catarrh, with occasional subacute febrile attacks lasting from one to two days to several weeks. Here, again, we have two possible causes of the fever:

1. A mild grade of inflammation of the mucous membrane of the ilium and colon, or
2. A bacterial decomposition of the contents of the intestine, including both chyle and the secretions of the gut itself, with absorption of the products of this bacterial activity.

What, then, is the cause of such fever? It may be a local inflammatory process, or the irritation caused by the fermenting contents of the intestine or the effects of the toxins after absorption, or possibly the result of the absorption, of bacteria.

That toxic substances can produce fever must be admitted. This is shown by the reaction of the normal body to injections of tuberculin, diphtheria toxins and peptones. It is found that bacteria may and frequently do enter the circulation as a result of injury to the epithelial cells of the intestine caused by the fermenting or putrefying solution or the bacteria in it. In typhoid fever, paratyphoid and colon-bacillus infection (under certain circumstances) these organisms can be recovered from the urine

or blood. The agglutination serum-reaction is perhaps the most certain proof of absorption of the toxins or bacteria in these cases, but it does not distinguish between the absorption of the toxins and of the bacteria themselves.

It is now generally admitted that most of the acute digestive diseases of infancy are associated with a change in the bacterial flora of the intestine, and that this change is the chief etiological factor in their production. This can most easily be shown by stained smears of the feces. This change may show itself in these smears by a variation in the normal bacteria or by the appearance of new bacteria only occasionally found in such stained smears. Usually the bacteria under the microscope gives a characteristic appearance in each case. Some one organism predominates over all the others.

The best method of distinguishing these organisms is with the Weigert-Escherich stain.

That bacterial infection is the cause of many cases that we have heretofore regarded as acute or chronic intestinal indigestion seems probable by the following:

1. The predominance of certain bacteria in the microscopic field which gives it a characteristic appearance.
2. The presence in cultures made from the stools of a great number of a certain kind of organism.
3. The penetration of bacteria through the damaged mucosa and their presence in the blood and urine.
4. The contagiousness of these cases.
5. The appearance of such cases in epidemics, in hospitals and nurseries. The contagious nature of certain diarrheal diseases in babies is now well known. The contagion can be carried by flies, by soiled linen, by nurses' hands or by toys soiled by the discharges. In infant hospitals and nurseries these cases should be isolated and flies excluded from the room. Much might be said on this phase of the subject, but it would lead us away from the general object of this paper.

Escherich has given us perhaps the first clear picture of diarrheal disease due to specific infection. He describes three classes of these infections due to three different organisms. Shiga and Flexner have demonstrated that certain of these diseases are due to special bacilli described by them.

That these infectious diarrheal diseases appear in the epidemic form has been noticed by Finkelstein, Escherich and Pfaundler. It has been the writer's experience to have seen such an epi-

demic in a nursery during the past summer, consisting of about fifteen cases, with three deaths. The character of the organism in these cases was not definitely determined but the symptoms, character of the stools and the simultaneous appearance of a large number of cases in a nursery demonstrated without a doubt that they all suffered from the same form of infection.

A class to which I wish to draw particular attention are those subacute or chronic cases of intestinal disturbance in which fever is the most prominent symptom. They are, in my experience, especially prevalent at this season of the year, and frequently follow or, rather, are chronic forms of infection continuing after the acute symptoms have disappeared. Some of these cases give no history of a recent acute infection or any recent acute symptoms, but are associated with constipation. Such cases usually give a history of repeated attacks of fever attended by obstinate constipation, offensive breath and putrid stools when free evacuation is secured. These are cases usually described as cases of intestinal indigestion, but which, I believe, are rather to be regarded as cases of chronic infection with acute exacerbations. An attack will sometimes be preceded by a vigorous appetite and probably by overfeeding and by obstinate constipation. Sudden changes of temperature, excessive fatigue or mental disturbance, such as a fright, may precipitate an attack in such children independent of any change in the diet. I have observed in a number of cases that the mother or father or other children in the same family suffered from a similar condition, suggesting the possibility of communication of the infection from one member of the family to another.

In two recent cases in two separate families there was an apparent infection of one child from a brother or sister. I can illustrate the subject best by citing cases representing the above classes.

CASE I.—Baby P., six months old. Seen at the seashore during the past summer in consultation with the attending physician. There was fever ranging from 100 to 105, irregular in character, and with little apparent effect upon the general condition of the baby, except loss in weight. Two weeks before coming to the seashore it had suffered with an acute attack of gastro-enteritis, from which it had apparently recovered. On the advice of the attending physician, the child was taken to the shore. It had had no fever for a week prior to the removal. Two days after its arrival at the shore, the temperature began to rise, and at the time of my visit it had been continuing for about one week. An

examination revealed no cause for the fever except a slight disturbance in the character of the stools, which were somewhat green, contained a considerable amount of mucus, and had a pungent, unpleasant odor. Under the use of colonic irrigation and small doses of castor oil, the temperature dropped, but remained normal only a few hours. Repeated colonic irrigation would lower the temperature to nearly normal, but only for a short time. At a second visit a specimen of blood was taken for the Widal reaction and a smear made and examined for malaria. A specimen of the urine was obtained for the diazo reaction. All three of these tests proved negative. Milk was excluded from the diet for twenty-four hours, when the temperature went to normal and remained so. After twenty-four hours, milk was resumed and the temperature again began to go up. The stools did not again become offensive. The milk was again withdrawn, barley water and whey were substituted, and the temperature remained normal. The child made a good recovery after a nearly continuous fever lasting two weeks.

CASE II.—Baby S., aged eighteen months. Child was nursed for nine months. When the child was about four months of age the mother consulted me because of the refusal of the child to take the breast and because of the putrid stools and frequent irregular fever and failure to gain weight. In spite of treatment, these conditions continued more or less persistently for several months, when I finally advised weaning, since which time the child, with the exception of occasional so-called bilious attacks, has been fairly well until the present summer. While absent in the country the baby had an acute attack of diarrhea which was treated by a local physician with apparent relief from all acute symptoms. On returning home, the mother consulted me for the old complaint of lack of appetite and putrid stools. The stools were excessively offensive, thin, brownish and contained considerable mucus. The urine gave no diazo-reaction, but the indican was very abundant. Typhoid and malaria were excluded. The removal of milk from the diet seemed to have no effect in checking the putridity. Colonic irrigations, antifermentatives and a daily small dose of castor oil produced very considerable benefit. It should be remarked in this case that the mother was a neurasthenic and suffered from a mucomembranous colitis which may reasonably be suspected as the cause of the early infection of this baby.

CASE III.—Baby H., aged nine months. In the spring of 1907, I was asked to see the baby who was suffering with a bronchitis and symptoms of an asthmatic character. This had received treatment for several weeks without relief; the mucous secretion was very abundant and breathing somewhat difficult. The little patient was obstinately constipated and his stools, when he had any, were offensive. I believed that his lung complication was greatly aggravated by his lack of elimination. Accordingly, he was given regular daily doses of cathartics, when the asthmatic bronchitis rapidly gave way, but at varying intervals of one to

two weeks he would suffer with these attacks of obstinate constipation and return of the cough, fever and total anorexia. The cough and fever would disappear and the appetite return after free purgation and only after it. These attacks continued until he was able to walk and live largely on farinaceous food. Even in the intervals between the attacks of constipation, fever and anorexia, the stools were always abnormal in odor. This case illustrates chronic infection with acute exacerbations. There was no evidence in the stool of indigestion preceding the attacks of constipation, and no cause could be found for the recurrence of these attacks, other than the constipation.

65 SOUTH PORTLAND AVENUE.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

(Continued from September.)

PUBLIC SCHOOL EDUCATION.

DR. CHARLES GILMORE KERLEY, New York, delivered the President's address. His subject was considered from two standpoints, that which related to the child's physical development, and that which related to the child's mental development.

In the United States there were 18,000,000 children in attendance at public schools. The school year had been increased from three months to ten months. Parents see comparatively little of their children. The chief control of the child has been transferred from the home to the school, which means that the duties and responsibilities of the public school have increased tremendously. It means that the majority of these 18,000,000 children will complete their school days between the ages of 14 and 16 years. What do they know? How are they prepared for a complete living? The child under 14 years of age is, by law, in New York State required to go to school. The State takes the child from his games and from the street or field or parks and puts him in school and demands that he remain there over five hours a day, five days a week.

In New York City 600,000 children are being compelled to read more or less for five hours a day, in an artificial light. Dr. Gulick reports as follows: "At the recent physical examination in Minneapolis, Minnesota, it was reported that only 17 per cent. of the children were defective; Boston reports 54 per cent.; New York, 60 per cent., and Sioux City, 80 per cent. The range in eye-sight is about the same. Columbus, Ohio, reports 25 per cent. New York, about 30 per cent., while Wellesly, Mass., reports 63 per cent."

The first regular medical inspector in America was Dr. Morreau Morris and he was appointed in New York City in 1892. There

are only sixteen states that provide for fire-escapes and fire protection. Only Massachusetts and Connecticut have established a standard of ventilation and require its enforcement. In Indiana there is no medical inspection. The large proportion of the children in the public schools come from non-English-speaking countries or are children of those who came from those countries. The late census showed the population of native and foreign parentages in 1900 as follows: Boston, 77.2 foreign; Chicago, 77.4; Detroit, 77.4; Jersey City, 70.5; Milwaukee, 82.7; Newark, 82.8; New York, 76.9; St. Paul, 72.6; San Francisco, 78.1.

Social Prophylaxis.—Dr. Morrow states that 75 per cent. of the total population have, or have had, gonorrhoea, and that from 10 to 18 per cent. have syphilis. It will be conservative to state that the morbidity in both these infections in this country is present in the male population in 60 per cent. From 60 to 80 per cent. of the acute inflammatory pelvic disorders of women are due to gonorrhoeal infection innocently acquired, and 35 per cent. of all operative pelvic conditions in women have the gonococcus as the etiological factor. Thirty per cent. of blindness was attributed to gonorrhoea. It is estimated that 50 per cent. of the cases of gonorrhoea in men are contracted before the twentieth year. Morrow has stated that the ideal of good education to which most parents clung, was one which entirely ignored the existence of sex, the most important feature of life. Through a lack of courage, or through a sense of false modesty, the system of generation was looked upon as a system of shame. Let it be taught what constitutes morality, but do not forget the physical side of the subject. The possible causes and effects of transgression should be known. Dr. Kerley knew of three girls who became pregnant in the thirteenth year, and not one of them knew the nature of the sex-relation.

Children were being educated to-day to the danger-point. Colleges and schools were founded and endowed. Scholarships were supplied. There was an American spirit of "getting there" regardless of the method. They did it in public life. They did it in politics. The system of prizes and rewards for the best recitation, or sets of answers on a given subject, was a bad one as it overtaxed the pupil. Bringing the child up in an atmosphere thus charged was the inevitable cause of much disappointment, suicide and life failures; and for the reason that the person was led to think that he might be able to accumulate ten, twenty or thirty thousand dollars a year, when he had only a two-dollar-a-day brain. This spirit with the encouragements of scholarships, rich men's colleges, and steps toward the so-called higher education, induces the youth to spend years in striving, and to end in failure more or less complete. This overeducation of the unfit brings forth tastes, traits and desires that he should not know of, and is a cause of much thieving, gambling and all around dishonesty.

When position and wealth, or reasonable competency did not follow by legitimate means, the false were seized upon. The labor-question in this country was a most serious one. Five to ten dollars a day for a so-called eight-hour day was paid. During the past twenty years the sons of carpenters, shoemakers, plumbers, brick-layers, etc., did not wish to follow the occupation of the father. These boys would be lawyers, bank presidents, physicians, etc., and, sorry to relate, some of them became lawyers and physicians. Now they were not bank presidents, but poorly paid book-keepers. Ten per cent. of those graduating in medicine fail to make a living and seek other occupations. Every boy who has to go out and become a member of the working class, as millions must, should have inserted in his curriculum a few minutes devoted to a talk on honest toil and the nobility of labor and be told that the only dishonorable work was that which was badly done. To-day there were 18,000,000 boys and girls in the public schools not being furnished the physical advantages they had a right to demand. They were not being taught what it was in their best interests to get. They were not being taught how to live. If they were to judge of their public-school educational course according to the degree with which it discharged its function they were forced to admit that it failed.

AN UNUSUAL TYPE OF ACUTE NEPHRITIS IN CHILDREN.

DR. JOHN LOVETT MORSE, of Boston, had seen a number of cases of acute nephritis of late that had been different from those usually seen in children in that there was complete or almost complete absence of blood and blood-elements, and there were present a large number of small round mononuclear cells, often associated with a number of polymorphonuclear leukocytes. The course had been much the same as in other forms of acute nephritis except that the duration was shorter. The prognosis was better. He cited a number of cases in illustration in which the amount of blood had been moderate in the beginning and disappeared after a few days when the urine took on the characteristics referred to above. The blood-elements were few even when the symptoms were marked and there was a large amount of albumen. It was not only by examination that the type was found to differ from the ordinary type but by the absence of blood-elements and the presence of large numbers of polymorphonuclear leukocytes or small round mononuclear cells and the comparatively large diameter of the casts. The cases might possibly have been somewhat milder than the ordinary cases, and of somewhat shorter duration. Cases of this type might end in death, be accompanied by convulsions or develop into the chronic type. He knew nothing of the pathology and had never had the opportunity to autopsy a case. It was probably, however, that the pathological changes were somewhat different from those in the cases described by Huber. It seemed probable

that there were few or no changes in the glomeruli. Taking into consideration the number of the cells and the diameter of the casts it was likely that the pelvis of the kidney and the lower tubes were more involved than those higher up. The condition was probably more of a pyelonephritis than an ordinary acute glomerular or interstitial nephritis.

DISCUSSION.

DR. HENRY KOPLIK, of New York, said the paper recalled Dr. Osler's description of certain cases of typhoid in which such kidney trouble occurred, in which there were leukocytes and casts in the urine. The difficulty, in these cases was how to distinguish them from infectious nephritis. In cases of gastroenteritis followed by nephritis, especially in female children, there was a question of involvement of the ureters and bladder.

DR. J. H. MASON KNOX, of Baltimore, spoke of a case of this kind in which there was hematuria, a number of leukocytes and a small amount of nuclear cells and casts. At autopsy the kidneys showed the convoluted tubules undergoing hyaline degeneration. This case belonged to that group of cases in which degenerative changes were the most marked feature.

DR. L. E. LAFETRA, of New York, had had such a case in which the leukocytes persisted for a long time after the disappearance of the casts. The child was otherwise in good condition and he had been unable to find the origin of the trouble.

RECENT DIAGNOSTIC METHODS IN CHILDREN.

DR. L. EMMETT HOLT, of New York, presented charts showing the fever-reactions to tuberculin, the tuberculin eye-test (Calmette) and the tuberculin skin-test (v. Pirquet). From these charts the following was deduced: Of the fever reactions to tuberculin, of the positively tuberculous, 22 were positive, one was doubtful and one was negative. Of the cases probably tuberculous there were 17 positive, and no doubtful or negative reactions. Of the cases probably not tuberculous, there were two positive reactions. Of the positively nontuberculous cases, one gave a positive reaction, and 60 negative reactions. There had been no untoward results among the 568 tests made.

Of the tuberculin eye-test (Calmette), of the positively tuberculous there were 24 positive reactions, three doubtful reactions and eight negative reactions. Of the probably tuberculous cases, 15 were positive, one was doubtful. Of the probably not tuberculous, two were positive, six were doubtful and 508 were negative.

Of the tuberculin skin test (v. Pirquet), of the positively tuberculous seven were positive, one was negative. Of the probably tuberculous, nine were positive and one was negative. Of the probably nontuberculous there were 41 negative. Of the positively nontuberculous, three were negative. As regards reliability the fever test was not so scientific.

Tuesday Morning Session.

DR. WILLIAM P. NORTHRUP, of New York, said his conclusions agreed with those of Dr. Holt. Speaking of the injection test he said that some years ago they had carried out 65 tests on adults under the direction of Dr. Trudeau. He could not take as cheerful a view of the test as did Dr. Holt because it made those people very sick and he thought there was some risk as it was administered at that time. He thought that after Dr. Holt had had his first accident with the eye-test he would take a less positive view of that. He had not personally had such a case but he had seen one in a public institution. The proper dosage had been given and in the proper way but the child reacted very badly. With regard to the skin-test he said there should be three little points of scarification. He had adopted a little instrument used by Dr. Trudeau—a small screw-driver such as was used for eye-glasses. It removed enough skin to make a uniform little round place. Dr. Baldwin suggested a broth for the first, broth plus old tuberculin for the second and plus tuberculin 10 per cent. for the third.

DISCUSSION.

DR. THOMAS MORGAN ROTCH, of Boston, said they had been carrying on various tuberculin tests in the Child's Hospital and that they had a great deal of material. There was a special dispensary for tuberculosis. They saw many cases in which careful study had led them to believe the trouble was tuberculosis but where the diagnosis was very difficult to establish. They met the light forms of miliary tuberculosis where the disease could only be distinguished by the Roentgen ray. Having been fairly diagnosed they were forwarded to his wards in the Child's Hospital where they were kept for a few days and the diagnosis carefully gone over and substantiated. Then they were sent to another hospital where he had complete control with from 60 to 80 beds. Here he had 20 of these cases of obscure tuberculosis under his eye all the time. It was from this material that he drew his conclusions. As Dr. Holt had said the fever-test would not be as popular in the future as the eye- or skin-tests, because there were a large number of cases in which we were doubtful whether or not we were dealing with tuberculosis, and we could not make the test because the fever prevented. There was still a question whether the fever-test did not give more exact results when it could be used. He had never met with any serious results in using the fever-test except where there had been a fault in the technic. The children did have some ill effects from the injection test, but not to compare in any way with what he had suggested. If the adult patients suffered so much it was different with the children. They never hesitated to give this test where they could. At times the child had a slight malaise and a little erythema. He

cited two cases in which the tuberculin test had reacted in the extreme degree. Whatever danger the child had undergone from extreme dosage and whatever the mistake, she began to improve from that time and her tuberculosis was cured. The second case was not so fortunate. This child was a brother of the first case; he reacted violently to the test, fell into a state of collapse and died. Autopsy showed an extreme tuberculous condition of the ileo-cecal valve. On investigation it came to light that an undiluted old solution had been used. They had never seen any bad results from the eye-test. One of his assistants had given it in 100 consecutive cases without reference to tuberculosis, and it seldom gave a reaction where there was not tuberculosis and in almost every case disclosed the tuberculosis. Those who were carrying out the investigations for them gave small doses frequently repeated. They were making observations on the skin-test and hoped that they would be able to use it as it made a great deal of difference as to the rapidity with which they could make the tests and get results. In repeating the eye-tests they had found it better not to repeat in the same eye.

DR. AUGUSTUS CAILLE, of New York, wished to put himself on record as opposed to the eye-test. His first introduction to the eye-test was six years ago when a guest of Dr. Dunbar. He experimented with pollen for hay-fever by putting it in his eye and when he found it became red he applied the antibody. He said at that time that he did not think the eye was a proper organ for experimentation.

They had used the tuberculin test in 63 cases and found it to fail in 5 per cent. of the cases. In two cases of tuberculous peritonitis that came to operation on the same day, in one the test showed reaction and in the other it did not. The advanced cases failed to react. He thought the test fairly unreliable and in a general way was opposed to it.

DR. HENRY KOPLIK, of New York, had been using the tuberculin test for several years. The Pirquet test was useful in those cases where fever existed and the tuberculin test was ruled out. The primary dose was smaller than that used by Dr. Holt. They used $\frac{1}{10}$ mg. and ran it up as indicated. Their results with the Pirquet test would be published at the Tuberculosis Congress. They found it quite reliable and convenient. They used one positive scarification and two controls, one with salt solution and one with carbolyzed glycerine. He had never allowed the eye-test to be used in his service. He related the case of a child that he was called to see where there were no clinical signs of tuberculosis. The child had passed through a slight grippe attack and was running a little temperature. The eye-test was used and a most violent reaction resulted and the child was labelled as acutely tuberculous. There was a panic in that family. There was a slight leukocytosis which was against a diagnosis of tuberculosis. The child recovered in a few weeks,

gained five pounds and regained a normal color. The child might show later that the test was correct, but that had nothing to do with the embarrassing position in which the family was placed.

DR. S. McC. HAMIL, of Philadelphia, had undertaken three tests with several ideas in view. His original plan was to rule out the eye-test because he thought it something of a risk. He had, however, used it in 177 cases and regretted to say that this preconceived idea of the eye-test was strongly confirmed in his results. He obtained eight very disturbing eye conditions. He was working with institutional children and, so far as possible, selected cases where there was no contraindication. He suspected that the eye-test was more dangerous in children than in adults. Dr. Holt was seeing a better class of cases but notwithstanding that in 516 cases he had positive results in 70 per cent. In 144 cases he employed the cutaneous test and the ointment test of Moro. In the earlier tests he employed the eye-test, then the cutaneous test and following that the ointment test and then took the balance of cases and applied the three tests at the same time. His results made it evident that there was practically no difference in the reaction of these tests. There was uniformity of action and uniformity of degree. The cutaneous test was most marked in 35 per cent. of the cases; the eye-test was most marked in 34 per cent. and the ointment test in 24 per cent. In 8 per cent. he applied the cutaneous test in confirmation of the others. He thought that in the light of the results that were being obtained with the other tests we should not use the eye-test. The subcutaneous test gave positive results in all but one case. The dose used was $\frac{1}{10}$ mg. and repeated in about 25 per cent. of the cases. The dose was advanced to 1 mg. if necessary. He had failed to get any return reactions in cases that had reacted positively to the other tests. He started out by knowing nothing of the physical condition of these children so that he was unprejudiced in the interpretation of results. The reason the percentage of reactions was so high was because he was working in a very much overcrowded institution where there were a certain number of definite cases of tuberculosis and in which perhaps some of the attendants had the disease. He had some late reactions with the Moro test. One persisted at a maximum for almost four weeks. They made histological studies in some of these late cases. He had sections cut from the tubercles and compared with sections from the papules of recent reactions. His results were not like those of Dales in that he found nothing of the histology of the tubercle which he discovered. The tuberculin with which he was working was thoroughly filtered, which might account for the difference. He used both human and bovine tuberculins in 20 cases. The reaction in eight of the cases was the same to both tuberculins; in two cases the reaction was much more marked in the bovine than in the human area.

He had anticipated this because the bovine was a weaker tuberculin than the human, owing to the fact that the tuberculin was not prepared from weighed amounts but from definite quantities of cultures and the bovine grew less luxuriantly than the human cultures. He applied the human tuberculin to two points in the cutaneous test, while he used the bovine for one. He wanted the test to be to the disadvantage of the bovine tuberculin.

DR. A. H. WENTWORTH, of Boston, called attention to the positive reactions in healthy cases. There were many tables published in German literature in which healthy persons gave positive reaction. In one series one-sixth of the cases gave a positive reaction for the eye-test and almost one-half for the subcutaneous test. He did not know how they proved these cases to be nontuberculous.

DR. L. EMMETT HOLT, of New York, closed the discussion. Dr. Park had told him that they made no deductions from results when one man used a half per cent. and another used one per cent. tuberculin because it differed so much in strength. In regard to the positive reaction in apparently healthy persons he said he wondered if Dr. Wentworth had seen the recent article in which statistics were compared of these tests and an equal number of autopsies, the point being to determine the latent tuberculosis. In these cases latent tuberculosis steadily rose from the first few months to past 14 years. He emphasized the importance of studying the sputum in these cases. The case should be gone over again and again.

DR. KOPLIK had raised an interesting point in regard to getting the reaction in a nontuberculous person. That did not apply to the eye alone, but to all the tests. The situation was difficult. The fact that the child got well for the time being proved nothing except that the disease he was having at the time was not due to the tuberculous lesion. He thought people should know of the existence of latent tuberculosis so that they might take proper steps toward its treatment. We should be careful to discriminate between latent tuberculosis and another existing infection.

A PLAN OF DEALING WITH ATROPHIC INFANTS.

DR. HENRY DWIGHT CHAPIN, of New York, read this paper. The problem of dealing with a sick and ailing child of the poor would be considered. The usual form of charity intended for their relief consisted in an attendance at dispensaries, day nurseries, visits of district physicians or nurses from the dispensaries and settlements, extension of hospital accommodations to proper cases, fresh-air excursions and to some homes in summer. But there was one disheartening feature that occasionally confronted the work, and that was the wretched environment that they found surrounding them when they returned to their homes. The Speedwell Society was inaugurated in 1902.

Cases have been placed in carefully selected farms in the neighborhood of Morristown, N. J., which afforded a very healthy location. A doctor and trained nurse had constant oversight of the cases. The foster mother was instructed in the feeding and care of every baby. The supervising nurse procured the children from the city and returned them to their homes. She also saw that the improved methods of caring for and feeding the infants were carried on after the child had been returned home. This practice was particularly applicable to infants but it must be emphasized that this kind of work could be done better by this boarding-out system than by institutions.

Since the Speedwell Society was inaugurated, six years ago, the following results had been recorded. The first child was sent out on March 19, 1902. The total number cared for from that date, March 19, 1902 to March 19, 1908, was 817.

The ages were from three months to five years. There were 103 deaths.

Briefly summarizing a plan which had worked well and which advised in the future dealing with neglected infants suffering from marasmus he offered the following:

1. Boarding out in a selected area of the country noted for its healthy conditions.

2. Constant attention to hygiene and diet on the part of a physician and nurse who are familiar with that class of cases and competent to deal with them.

3. Infants were kept as long as necessary until feeding was regular and digestion and assimilation were improved sufficiently to result in an increase in weight.

4. To train up in a good neighborhood a number of foster mothers who by taking these infants into their homes become experts in handling them and are far superior to those offered by the best of institutions.

If this plan was followed a large majority of these infants could be saved. No previous capital is required to be tied up in building, but the visiting doctor and nurse should be paid a salary; outside of this all the money contributed goes directly to the board of the children. If contributions fall off, the work can be contracted until some more money comes in. Every large city having much destitution can look after its waifs and save most of them by arranging to board them out in some neighborhood according to the method of the Speedwell System.

FRESH AIR IN THE TREATMENT OF DISEASE.

DR. WM. P. NORTHRUP, of New York, said he wished to bring up two points in regard to the fresh-air treatment of disease, first, the practical application of the fresh-air treatment and, second, in what particular cases were they to adopt it. It was no longer a question that the fresh-air treatment for acute febrile diseases was of value for they now had some experience with it. He asked what was the practical application of this?

What could they do with the cases now? Was cold essential in the treatment of these cases? He answered, Yes. Cold was an element of great value. He then spoke of the experience of the health department of New York, in the treatment of the tuberculous insane. The first clinical manifestation that impressed the observer was that these insane people, placed in the open shacks, lived and slept well without "dope." Sleeping in the open and cold air made them sleep quietly. The fever and the maniacal excitability of these patients were controlled and they slept better. He thought that one of the first rules in the practical application of fresh cold air was that the patient, as well as the attendant, should be made comfortable, and this could be secured even in quite cold weather. The comfort of the nurse should be aimed at as well as the comfort of the patient. The nurse should be friendly to the method. To make the nurse comfortable was very important to all concerned.

With regard to the preparation of the bed, there should first be laid upon the spring mattress a large blanket which when folded should completely envelop the patient. Inside of this there should be a paper or rubber layer to keep the cold from coming up from below. The air should not have a chance to get at the patient from below. The patient should be clothed throughout with a union suit. In this way they were sure to be free from the danger of the sudden impact of cold air.

He asked what disease should be treated in the open air. This question he said he could not answer in full. He had always selected for treatment with the open air such diseases as pneumonia, scarlet fever, diseases with high temperatures, etc. Dr. Northrup reported the successful treatment of a case of malignant scarlet fever with a temperature of 107.4, with the outside thermometer registering zero, with the temperature in the room about 10 above zero, everything in the room freezing. The treatment of this case convinced him that there was nothing better than the open and cold air combined.

With regard to the treatment of measles by the open and cold air, and whether they should keep these patients out, he said he did not know. They had tried this treatment at the Foundling's Hospital, but he was not yet prepared to give any conclusions. The treatment of cases of bronchitis in the open air had always resulted favorably.

DR. LAMBERT, of New York, claimed that the open-air treatment of lobar pneumonia in adults shortened its course.

What were the results of the open-air treatment of diseases. He had made no tabulations and could offer no percentages, but he believed the open-air treatment killed no one; it did not even hurt anyone. He was equally sure that it helped all. In the doubtful and desperate cases it had determined the balance in the favor of a cure of every patient.

DR. E. E. GRAHAM, of Philadelphia, for eight years had used the fresh-air treatment of diseases in the Philadelphia Hospital.

He believed that hospitalism was the result of lack of fresh air. The cribs were moved near the fire escapes and immediately the infant mortality began to lessen. During January, February and March the children were kept in hammocks of small size; they were bundled up in blankets, and their eyes, nose and mouth were covered with gauze veils. These children did remarkably well; instead of dying they gained in weight and this occurred in infants under three months of age whose condition was distinctly bad on admission to the hospital.

During the past five years they have had practically a new and up-to-date hospital, and the infants have an abundance of fresh air day and night, and Dr. Graham said that he was now an optimist and not a pessimist regarding the roof-garden used winter and summer. Of all the factors that reduced the infant mortality, fresh air was one of prime importance.

During the past three years he had treated all the severer cases of broncho- and lobar pneumonia in children of all ages by the fresh-air treatment. The infants and children were removed from the general wards and placed in special rooms for such cases. The rooms held five or six cribs comfortably. Many of the cases so treated were secondary bronchopneumonias, and a large percentage of them hospital children. The results had been so different from the old plan that he now had lost the dread of pneumonia as a hospital disease.

In another, but similarly arranged room, they treated their typhoids, and occasionally a case under two years old; most of them, however, were over three years of age. The average age was six years. They had so much better results from the use of fresh air that nothing could persuade them to return to the old methods of treatment. The hands and feet of the children were kept warm by the use of gloves and stockings and hot-water bags.

The tuberculosis cases lived practically in the open air in special places. At the Jefferson Hospital many cases were treated by fresh air. In his private practice, whenever possible, all infants and children, sick or well, were placed in the open air. Rickets, scrofula, gastrointestinal diseases, and many other conditions had been benefitted by this treatment. Measles in hospitals were treated in separate rooms, each room opening out onto a porch which was surrounded by glass. There was an abundance of fresh air provided. All children under three months of age were kept in the wards for a few days at a temperature of 60; then they were placed out-of-doors. In private practice, where the temperature could be controlled more absolutely, they gradually lowered the temperature of the room to 60. The child was dressed as if to take out-of-doors; the temperature of the room was then lowered until it approximated the degree of temperature out-of-doors. Then the child was taken out.

DR. AUGUSTUS CAILLE, of New York, agreed with every thing that the speakers on this subject have said. Twenty years ago

he had tried to make the ladies in charge of the babies' wards see the importance of fresh air but they insisted that it was dangerous and that the infants would have to be boosted up with strychnine. Now they had a roof-garden, part of which was open and part covered. He wished to emphasize the fact that breathing fresh air was the most important therapeutic agent we had.

DR. A. JACOBI, of New York, said that in 1870 he had been a member of the medical staff of the Nursery and Child's Hospital, the pet institution of the elite ladyships of New York City, and when he proposed boarding out the infants and taking the curtains from the cribs and proved that of 100 infants admitted to the hospital and retained there over three months 100 died, he was expelled from the institution. Times had changed. He heartily endorsed Dr. Chapin's views. Rachitis, which was scarcely known fifty years ago in this country, had increased to a great extent on account of immigration and poverty. This disease was attributed to bad food but he believed it was due more to bad air. The northern Russians and Swedes had rachitis in their best families because their winters were eight or nine months long and the children were not moved from their close quarters. He said that a man who was now a successful surgeon in New York had had cranial tabes and convulsions when seven or eight months of age and the only thing that saved him was keeping him out of doors. From the time he was taken out he no longer had convulsions.

DR. R. G. FREEMAN, of New York, said that in 1907, there were two epidemics of measles on his service, 71 cases and only one death. The second epidemic was very severe, accompanied by a good deal of otitis and some pneumonia. The whole ward came down with bowel trouble. The children were put outdoors and after that there was no trouble at all. In March he was on duty at the Foundling Hospital where there was an epidemic of measles and scarlet fever. Measles began to break out in the scarlet-fever ward and they did not know what to do with them so they put them out on a closed piazza. All the measles cases were put out and they did remarkably well. One case had bronchopneumonia starting with the measles and that case did well too. What Dr. Jacobi said in regard to rachitis interested him as he had felt that it was a disease of asphyxiation. The fact that it was a disease of winter and that they were better in the fall and the failure to produce the disease with different forms of feeding pointed to the conclusion that rachitis was a disease of bad air.

DR. J. P. CROZER GRIFFITH, of Philadelphia, called attention to the fact that there was a difference in the way the term fresh air was used. When Dr. Northrup exposed a child with scarlet fever, having a temperature of 107 to cold air to reduce temperature it was a very different thing from breathing fresh air. There could be no discussion as to the advisability of having these children breathe fresh air. When an authority says children during the first few months of life bear cold air badly he does not mean

breathing cold air, but chilling of the body. None of us would put a child in a cold room and take the covers off of it.

DR. E. M. BUCKINGHAM, of Boston, said that the last speaker had said what he would have said. Some pneumonias suffering from dyspnea in the hospital were relieved by putting them in the fresh air even when the administration of oxygen did not give relief.

DR. C. B. PUTNAM, of Boston, had been connected with the Massachusetts Infant Asylum for 35 years. At first they farmed out a few children, but since the plan had been developed until at present less than 25 out of 125 were kept in the institution. The rest were boarded in the country and there had been a remarkable reduction in the mortality. The hospital was used for those who came in an emaciated condition and for those who were taken sick while in. Some cases were suited for hospital care a part of the time.

DR. L. E. LAFETRA, of New York, said the objections to the fresh-air treatment in private practice could be overcome by using the inside awnings, which permitted the child to breathe fresh air without being exposed. We had learned to do this in tuberculosis and had found it very satisfactory.

DISCUSSION.

DR. CHARLES G. KERLEY, of New York, was especially interested in the fresh-air treatment of typhoid fever, and was surprised that he had so little trouble in applying it in private practice. He thought the treatment of tuberculosis had prepared people for it. He would like to emphasize what Dr. Chapin had said in his paper on atrophic infants. He did not doubt but that oxygen deficiency had much to do with rachitis. If the baby had plenty of good breast-milk he could stand oxygen insufficiency, but if he was on the bottle and the milk badly prepared he would get rickets. He got it quicker under bad hygienic surroundings but he also got it under the best conditions. He still believed in nutritional disorder, *per se*.

DR. SAMUEL S. ADAMS, of Washington, said we should make a distinction between farming out babies when Dr. Jacobi had spoken of it and the present time. In his city they had a board of charities that watched over the children and they only gave out a limited number of children to be cared for. He had had as good results as the others and had been surprised how ready even the ignorant were to carry out the treatment. He related instances in confirmation of this statement.

DR. F. S. CHURCHILL, of Chicago, thought people were more ready to carry out this treatment than the profession at large believed. He had no difficulty in private practice and he had a nurse follow up the dispensary cases to see that orders were obeyed.

DR. P. J. EATON, of Pittsburg, said the question of the adaptability of the nurse had much to do with the matter. The famous

paper of Dr. Northrup's "23" had given him the inspiration to teach nurses the value of this treatment. He had lectured to them in four different hospitals and now they had a corps of nurses who carried out intelligently what was desired along this line. With the nurse properly trained in this respect they could get what they wanted.

DR. L. LOVETT MORSE, of Boston, had heard a great deal about fresh air for sick babies and all he had to say was that it did no harm to well ones.

DR. A. JACOBI suggested that the times of which he had spoken were different from the present, but he said that it was not more than forty years ago and a great many of the principles of good infant-feeding were known at that time. It was not the tendency to send babies out to a negro at that time so that those babies would have been fed correctly. The Department of Charities of New York City had begun to board children out one by one at farmhouses at that time.

What he had said was as true to day in institutions as it was then, and he was glad that common sense had begun to prevail.

DR. E. E. GRAHAM, of Philadelphia, said that it had been pointed out by a few in the early part of the nineteenth century that fresh air was a necessity. They had never had a foundling hospital in Philadelphia. In 1864 when the advisability of erecting one was discussed Dr. Jacobi was quoted as being opposed to them as so many of the babies died. At that time the idea of farming out the children was suggested, in other words, they were talking to-day about as they had done a hundred years ago. If, as a body, the medical profession was as enthusiastic about securing fresh air for children as they had been in the campaign for pure milk they would get excellent results.

DR. WM. P. NORTHRUP, wished to emphasize the point that Dr. Graham had made that we had raised the standard of the quality of milk and by paying equal attention to this other hygienic measure we would bring it into greater prominence. In the matter of drinking-water they also had accomplished much. He had purposely made his talk about pneumonia and its treatment in the open air. He thought the body breathed air and needed the stimulus as much as the lungs. In typhoid he was not at all sure that cold air would take the place of the bath. He had experimented to some extent in that direction. Dr. Oliver Wendel Holmes said:

"God lent his creatures light and air and waters open to the skies;

"Man locks his brother in a stifling lair and wonders why his brother dies."

DR. HENRY D. CHAPIN had for many years felt that he had not lived up to his light. They had seen hundreds of these babies slip through their hands and had not had the moral courage to tell the truth as Dr. Jacobi had. He had had the best hospital wards, the best roof-gardens, convalescent homes, etc., made for

these cases and yet it was always the same thing. The babies under one year all did badly. His plan was not exactly farming the babies out. He put them in a restricted part of the country, with skilled doctors and trained nurses and with people who could be watched. The children did better with this system.

(To be concluded.)

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Clinical Examination in Infants.—Marfan (*Le Bull. Med.*, July 4, 1908) states that the ordinary method of examination that is used with adults is not suitable for infants. In children too young to speak, all the subjective symptoms must be neglected and only the objective ones are of value. There are also difficulties produced by cries, fear, and resistance resulting from even the simplest physical methods. Deformities of the skeleton, such as are produced by rickets, and the condition of the skull and the fontanelles are important. The presence of the thymus, which in adults is atrophied, is to be noted. The tongue gives few indications in the infant and the significance of enlargement of the liver and spleen is not the same as in the adult. On visiting the young infant we must consider first the age of the infant, whether new-born, or prematurely born, and its weight at birth. In unduly small infants there is a condition of congenital debility which renders them particularly vulnerable. Birth before term may indicate syphilis, or may be due to some infection of the mother. In this case the infant is either affected with the same malady as the mother, or it receives the toxins from the mother's blood and is intoxicated by them. When the mother has suffered from ascites or hydramnios the child may have them, and syphilis is again suggested. At birth there may have been congenital fractures or convulsions. If labor has been long and the liquor amnii infected, the child may have rhinitis, stomatitis, parotiditis, or pneumonitis from infection, or there may be purulent ophthalmia. There may be congenital malformations. Hereditary syphilis is not always evident at birth. The next important series of questions refers to the nutrition of the infant; whether it has been breast-fed, and what is the general condition of the nurse, how she has been fed and cared for. Infants born of mothers that have been able to rest before labor are larger and stronger than those whose mothers have worked hard up to the time of labor. The condition of the breasts, the quality and quantity of the milk are of the greatest importance. Irregularity of nursing and the intervals between nursings are important. If the infant is bottle-fed, the kind of milk, whether properly sterilized and diluted, and whether taken from a healthy cow must be inquired into. The intervals of feeding and whether other foods than milk have been given should be known. The next question is as to the epoch at which the first teeth

appeared, and whether the sequence and time of eruption was normal. Retardation of teething is frequent in badly-fed infants, as well as in the rachitic. The age at which the child began to walk must then be considered, and at what age he began to talk. Then we must inquire into the presence of hereditary predispositions, such as tuberculosis, syphilis, and neuro-arthritic troubles. Next begins the history of whatever illnesses the child himself has had, whether it has been vaccinated, has had any of the eruptive fevers, or any digestive troubles. In the actual examination of the child all the organs must be methodically explored. The temperature must be taken by rectum. The child should be entirely undressed to examine the body, the skin, and shape of the bones, and to ascertain the absence of eruption or the presence of edema or abscesses. The lungs, heart, digestive and abdominal organs are explored, and the mouth, nose, genito-urinary system, and nervous system. Then comes examination of secretions and excretions, or false membranes feces and vomitus, and examination of the organs of special sense.

Congenital Idiopathic Dilatation of the Colon.—J. M. T. Finney (*Surg. Gyn. and Obst.*, June, 1908) records a case of this condition, known also as Hirschsprung's disease, in a boy of nine years. Beginning immediately after birth, he had always been constipated, and the abdomen unusually large. His bowels never moved normally, always necessitating a cathartic or enema, or both. He would frequently go three or four weeks without a movement. During these times he would have periods of severe abdominal pain, cramp-like in character, until after the bowels began to move. Under ordinary circumstances, he would have a movement once or twice a week, and the abdomen would be somewhat less distended. The stools were putty-like in character, and the odor very offensive. When seen by the writer the circumference of chest through the plane of the nipples was 54 cm.; of abdomen over the most prominent part which was at the epigastrium, 65 cm. At times marked peristaltic waves were seen crossing the abdomen, but without causing pain. Rectal examination was negative. Attempts were made for a fortnight to reduce the abdominal swelling by the aid of frequent enemata and cathartics, with only partial success. When the abdomen was opened its cavity was found to be practically filled with a dilated colon. The dilatation began abruptly at the hepatic flexure of the colon, involving the transverse and descending portions of the colon and the entire sigmoid, with the exception of the last two or three inches, where it as abruptly ended. The rest of the intestinal tract, including the rectum, was normal. The greatest dilatation was in the region of the sigmoid, in places 14 cm. in diameter. The intestinal walls were greatly hypertrophied. There were no evidences of localized obstruction or kinking. After a colostomy above the dilated segment, by which some of the impacted contents were later removed by irrigation from above and from the anus, a lateral entero-anastomosis between the segments just above and below the dilated

segment was performed. At a subsequent operation the dilated portion was excised, and the free ends of intestine closed. Uninterrupted recovery. In an interesting review of the literature the writer states that in the majority of cases the affection has its origin *in utero*. The principal seat of the pathological process is in the large intestine, and in more than one-third of all the cases, the sigmoid flexure is alone involved. In practically all the cases it is included in the affected portion. The whole of the large intestine was found involved in about 15 per cent. of the cases. The rectum and the small intestine are rarely affected. The chief clinical features are enormous distention of the abdomen and long periods between stools, one author recording an interval of three months between them. The alternation of obstipation with spontaneous diarrhea; the pasty discharges with foul odor; the frequent lack of relief from the abdominal distention, in spite of profuse and frequent evacuations, particularly in the case of small children; the gradual or rapid decline associated later with symptoms of intestinal perforation, or with some intercurrent affection, possibly pulmonary in character, all point strongly toward this condition. Absence of ascites aids in the differentiation from tuberculous peritonitis. The etiological factors for the affection which have been suggested are: (1) An abnormally long mesentery which might give rise to secondary torsion of the sigmoid. (2) A morbid process acting during fetal life, or an anomaly of development. (3) Colitis becoming chronic. Great distention following from the altered chemical changes in the feces, much gas being produced. Such distention of the gut would naturally render peristalsis more difficult, which would be compensated for by an increase in the size of the existing muscle fibers and the formation of new ones—a true hypertrophy. (4) Increased length of the colon, and a multiplication and exaggeration of its loops, especially of the sigmoid flexure, the dilatation and hypertrophy dependent upon the accumulation of gas and feces in the elongated looped portion of the colon. (5) Actual mechanical obstruction. (6) Congenital aplasia of the muscular layers of the large intestine immediately above the rectum. As a result of fermentation and putrefaction and the formation of gases resulting therefrom, there develops a well-marked ectasia of the intestine. Here, in turn, feces in large quantities accumulate. Finally, the efforts of the intestine to overcome this stagnation result in the development of a well-marked hypertrophy in the segment immediately above. (7) Spastic contraction of the sphincter ani associated with anal fissures. (8) A neuromuscular defect in one segment, through which the colon was unable to propel its contents. In this way, a functional hypertrophy of the segment immediately preceding the paralyzed and dilated one is produced. (9) Valve formation in the intestine. The present writer favors mechanical causes as a simple and plausible cause of the disease. For, though there can be no longer any doubt that an obstruction does not exist at

the time many cases are seen, we do not know whether hindrance to evacuation or peristalsis originally present could not have led to dilatation which now, making effective peristalsis more difficult, caused hypertrophy and the other changes, inaugurating a vicious circle. The author also discusses the various forms of medical and surgical treatment which have been employed.

Retention of Urine in Typhoid Fever in Children.—E. Gaujoux and V. Ros (*Ann. de Méd. et Chir. Inf.*, July 15, 1908) describes two cases of retention of urine in typhoid fever in children, and states that this symptom is comparatively frequent. It may occur when there is merely hebetude as a result of the general grave condition, or in cases with decided cerebral symptoms. Its cause may be paralysis of the muscular tissue of the bladder, vesical anesthesia, or spasm of the sphincter. When there is a medullary congestion in typhoid acting on the vesico-spinal center there may be paralysis of the bladder. Hypertension in the spinal canal may be an important cause. This may be relieved by lumbar puncture with withdrawal of fluid. In cases of typhoid we should always be on the alert for bladder symptoms, resulting in a painful, distended abdomen, with dullness over the bladder region. Catheterization is demanded, and the complication is not of grave import provided it be relieved at once, before back pressure on the kidneys or rupture of the bladder has taken place. The cause of the retention should be treated at the same time.

Koplik's Sign.—Mario Flamini (*Riv. di Clin. Ped.*, June, 1908) describes Koplik's sign as one that always occurs previous to the eruption in measles and renders the diagnosis certain before the appearance of the eruption on the skin. The doubt as to the presence and diagnostic value of this sign is due to a lack of observation of cases at the time when the sign is present. In order to confirm his observations of this sign the author examined daily every child in the children's wards during an epidemic of diphtheria in which one nurse and thirty-three children were attacked. He found Koplik's sign present in every case, from one to five days before the cutaneous eruption. The sign consists of a red areola in the center of which is seen a small bluish spot, situated on the buccal mucosa. The lesions are grouped and later become confluent. They are from two to six-tenths of a millimeter in diameter. They disappear with the incidence of the skin eruption. The author removed from the inside of the cheek a small portion of the mucous membrane containing several Koplik's spots and examined them microscopically. He found that the lesion consists of a hydropic degeneration of the round cells of the epithelium, especially in the superficial layers, with a necrosis of the pavement cells of the epithelium. No true vesicle is formed, but there is an approach to vesiculation. The author believes that Koplik's sign may be regarded as a form of eruption of measles on the inside of the cheeks. It is never found elsewhere than on the cheeks and lips.

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ORIGINAL COMMUNICATIONS.

A HEMOLYTIC TEST FOR MALIGNANT TUMORS.¹

BY
GEORGE W. CRILE, M. D.,
Cleveland, O.

INTRODUCTION.

I HAVE heretofore reported for the American Society of Cancer Research our observations upon hemolysis in malignant tumors. This is a report of further progress. The technic has been greatly improved and now seems to be quite accurate. It is exacting, must be precisely done and every step amply surrounded by checks and controls.

Dr. D. A. Prendergast made the first series of observations, after which Miss Ora Lewis took all the responsibility of the technic for seven months, and made many improvements during the period of her painstaking work. Dr. A. M. Tweedie has been carrying on the work since Miss Lewis' service and has made extremely valuable suggestions and alterations in the technic. My resident, Dr. H. G. Sloan, and members of my staff at Lakeside Hospital, Drs. Gamble, Eisenbrey and Pomeroy, have assisted in the clinical side. To the many suggestions of my associates and to their enthusiasm and resourcefulness in modifying and mastering the technic and compiling the tables I am under obligations.

The red corpuscle is covered by an exceedingly thin and delicate membrane which prevents the escape of its contents, the most important being hemoglobin. This covering is very sus-

¹ Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

ceptible to chemical or thermal changes in its environment. If impaired by such changes a part or all of the hemoglobin will escape and become freely diffused in the serum. The corpuscles then become proportionately paler, and if all the hemoglobin is lost there will remain only the frame-work of the cell—designated shadow cell or ghost.

Free hemoglobin may be detected in the urine and other secretions. If in quantity, it stains all the tissues, causing a brilliant jaundice. This process is known as hemolysis and the agents causing hemolysis are known as hemolysins. Hemolysins may be roughly classified as inorganic and organic. Inorganic hemolysins are such chemicals as ammonia, soaps, ether—any agent that will change the isotonicity of the blood serum. Among organic hemolysins are normal blood and tissue juices of alien species, and certain pathologic human blood and tissue juices. In pernicious anemia, in certain fevers, such as typhoid, occasionally in chronic suppuration, and in other general diseases there is such a change in the blood serum that when the red corpuscles from normal individuals are put into this serum, hemolysis occurs. It may be asked at once why such hemolytic serum does not destroy the corpuscles of the patient *in vivo*. It may be that the corpuscle shares the universal attribute of living matter whereby it is able, to a certain degree at least, to adapt itself to its environment; then, too, conditions *in vitro* are not wholly identical with those *in vivo*. A corpuscle having so adapted itself to its environment may itself become so altered that when it is again suspended in normal blood serum it may undergo hemolysis.

The medical importance, if any, that these facts may assume is determined by correctly answering the following questions: Is there a reliable technic for the determination of hemolysis? Are the changes in the serum and in the corpuscles thus produced by disease of a specific nature? Are they constantly present?

Many difficulties beset the technic. There are various inorganic hemolysins—a long list of chemicals. The blood must be drawn and kept absolutely free from these. Change in temperature markedly influences the result so that provision for absolute control of temperature must be made. As the corpuscles are very delicate, extreme care must be exercised in applying the mechanics of the technic. It is necessary that the technic be precisely carried out in obtaining the serum. Experience has shown that if the serum and corpuscles are immediately separated, either by drawing the blood in sodium-citrate solution or by im-

mediate centrifugalization, the hemolytic reaction is either minimized or negative. The maximum reaction is obtained when the serum and the corpuscles are separated by clotting. The serum attains its maximum hemolytic power in about twenty-four hours. In securing normal blood one must bear in mind the fact that it is not possible to absolutely determine except by an actual blood-test whether a given individual's blood will react as normal. But if several supposed normals are used at the same time and are tested against each other as well as against the blood of the patient, there is then but slight chance for error. Again, it has been shown that organic hemolysins are destroyed, hence rendered inert, by a temperature of 55° C. for ten minutes. Anticipating for a moment a part of what we shall say as to the results of our tests, we will now state that in every instance such temperature exposure destroyed the hemolytic power of the serum. The hemolysins of disease, so far as we have studied them, are of organic nature. Inorganic hemolysins, such as ammonia and other chemicals, are not influenced by heat. If, then, all the tubes of the entire test are made up in duplicate and one set subjected to a temperature of 55° C. for ten minutes, possible error from inorganic hemolysins may be excluded.

The test is determined by the result of suspending normal red cells in the patient's serum, and suspending the patient's cells in normal serum, as above indicated.

The technic in detail is as follows: Facilities required: a. incubator, b. refrigerator, c. centrifuge, d. sterilizer, e. one gross test-tubes, size one-half inch; twenty-four tubes, size three inches long, one-fourth inch inside diameter, f. test-tube racks made to hold seventy-two tubes, with each tube hole numbered consecutively in ink, g. glass beads for defibrinating the blood, i. several aspirating needles with stylets.

Comment.—These instruments should be cleansed in distilled water. The tubes to be set up in the test should be kept immersed in isotonic solution and taken out only when they are to be used. The large tubes are used in pairs, one for obtaining the blood for the cells, the other the blood for the serum. In the tube for the cells a glass bead is placed. Both tubes are then closed with cotton stoppers wrapped in close-mesh cotton cloth, sterilized, and set aside for future use. Needles are similarly wrapped in individual packages.

Obtaining the Blood.—The blood is drawn by aspirating a vein. The most convenient vein is usually the median basilic vein at the

elbow. The field is scrubbed with soap and water, then thoroughly cleansed with sterile water or, better still, with salt solution. The arm is firmly compressed well above the elbow by bandage or otherwise to dilate the vein. The needle is then inserted through the skin into the vein. Into the tube containing the bead 3 c.c. of blood is collected and the tube immediately and continuously agitated for about ten minutes. Defibrination of the blood is thereby accomplished. Into the other tube is drawn 10 c.c. of blood. This tube is kept at rest in a slanting position during the separation of the blood into clot and serum. The pressure from the arm should be removed before the needle is withdrawn; otherwise, a greater amount of blood than is necessary will ooze from the puncture in the vein. The further preparation of the blood consists in putting the defibrinated blood into a tube containing 20 c.c. .85% saline solution made up with distilled water. This tube and the one containing the clotted blood are now placed for approximately twenty-four hours in the refrigerator. Cold facilitates separation of the clot and serum and preserves the blood. The separated serum is pipetted off, put into a sterile tube and again returned to the refrigerator. In precisely the same manner blood is taken from three apparently normal individuals and subjected to precisely the same technic. At the end of twenty-four hours the supernatant fluid in the tube containing the corpuscles is poured off and 20 c.c. of fresh isotonic salt solution is added. When needed, the tube is gently shaken until the cells are in complete suspension.

Setting up the Test.—We then have the corpuscles and the serum from four individuals—the patient and three supposed normals. Using the smaller test-tubes, $\frac{1}{2}$ c.c. of the serum of each is put into each tube. Duplicate tubes of serum are put up. One set is subjected to a temperature of 55° C. in a water-bath for ten minutes. These tubes are now placed in the refrigerator until they reach the same temperature of the tubes remaining. After the required cooling, all the tubes are taken from the refrigerator. One-half c.c. of cell suspension of A, B, C and D is now added to the serum of A, B, C and D.

Testing the patient with three normals requires the use of thirty-two tubes arranged as follows:

Tube	1.	Serum A + cells of A.
	2. (heated)	Serum A + cells of A.
	3.	Serum B + cells of A.

4. (heated) Serum B + cells of A.
5. Serum B + cells of A.
6. (heated) Serum B + cells of A.
7. Serum A + cells of B.
8. (heated) Serum A + cells of B.
9. Serum C + cells of C.
10. (heated) Serum C + cells of C.
11. Serum C + cells of A.
12. (heated) Serum C + cells of A.
13. Serum C + cells of B.
14. (heated) Serum C + cells of B.
15. Serum A + cells of C.
16. (heated) Serum A + cells of C.
17. Serum B + cells of C.
18. (heated) Serum B + cells of C.
19. Serum D + cells of D.
20. (heated) Serum D + cells of D.
21. Serum D + cells of A.
22. (heated) Serum D + cells of A.
23. Serum D + cells of B.
24. (heated) Serum D + cells of B.
25. Serum D + cells of C.
26. (heated) Serum D + cells of C.
27. Serum A + cells of D.
28. (heated) Serum A + cells of D.
29. Serum B + cells of D.
30. (heated) Serum B + cells of D.
31. Serum C + cells of D.
32. (heated) Serum C + cells of D.

The tubes are now placed in a thermostat at a temperature of 37.5° C. for two hours. At the end of this time they are again placed in the refrigerator for twenty hours. At this time the hemolysis may be determined. This, of course, is determined by the pink discoloration of the supernatant fluid and the condition of the sedimented cells. Accurate notes of all the cases are kept by the numbers of the tubes. The result is read off by members of the staff who have no knowledge of the identity of any of the tubes. These observations make up the tables here presented. Almost innumerable changes were made in the technic until the present was attained. The results are now fairly uniform. Observations were made upon many normals and many varieties

of diseases. We shall to-day discuss the results of these observations, especially in the case of malignant tumors.

In 200 individuals without malignant tumors or infections there was no hemolysis; in 146 proven cases of malignant tumors hemolysis was observed in 84 per cent. In the last sixty-six cases tested by Dr. Tweedie 88 per cent. were positive. In fifty-one cases of infection, acute and chronic, hemolysis was noted in 6 per cent. Blood taken during hyperpyrexia in some instances showed hemolysis. In fifty-five cases of benign tumors there was no instance of hemolysis. Hemolysis was observed in nine out of thirty-four postoperative tests. Recurrence was proved in all nine cases. In twenty-five tests no hemolysis was observed and recurrence has not been demonstrated up to the present time. Numerous postoperative observations were made during the time patients were in the hospital. As a rule, hemolysis began to diminish after ten days, and generally after three weeks entirely disappeared in the cases treated by complete excision. In cases of partial excision hemolysis has not disappeared.

Summary.—Hemolysis was observed in 84 per cent. of proved cases. The negative tests were for the most part in late inoperable cases. Positive tests in the absence of cancer were observed in chronic suppuration, certain fevers and syphilis. In every instance observed, heat destroyed the hemolysis. In all cases observed, hemolysis disappeared within three weeks after the apparent removal of all of the cancerous tissue. We may conclude that the hemolysin is organic because it is thermolabile, and that its origin is in the growth itself because it disappears after removal of the tumor. We do not regard this test as diagnostic, but as important evidence of malignancy. *The entire subject is in the stage of investigation.* We can as yet form no conclusion.

THE OBSORNE.

THE OMENTUM AS A FACTOR IN ABDOMINAL SURGERY.*

BY

C. C. NORRIS, M. D.,

Instructor in Gynecology, University of Pennsylvania. Attending Physician Maternity Hospital, Philadelphia.

It is not my intention to take up the time of this society with a detailed description of the gross and microscopic anatomy of the omentum. It will suffice to say that in view of the recent studies of this organ it can no longer be looked upon as two simple layers of fat-bearing peritoneum that has no particular function, but must be recognized as a highly specialized organ—in fact, one of the most important in the abdominal cavity as far as the surgeon is concerned. One of the chief functions of the omentum is to pour out leukocytes, which cells actively combat any infection which may be introduced into the peritoneal cavity. The omentum is richly supplied with blood-vessels. Anyone who has ever handled an omentum or who has done much abdominal surgery can hardly have failed to be impressed by the numerous blood-vessels seen in this organ. These vessels are most numerous in the upper portions of the omentum and can easily be distinguished in their peculiar tree-like course by the naked eye. Between the branches of the blood-vessels are many clear spaces, often somewhat resembling ground glass in color. In the normal omentum these areas are nourished by imbibition. We all know how quickly the cornea of the eye will become inflamed as a result of inflammatory stimulus and how easily it will become reddened by numerous newly formed blood-vessels during a keratitis. The clear areas in the omentum are almost analogous to the cornea in their methods of responding to inflammation. Let a small amount of turpentine be injected into the peritoneal cavity of a normal animal and in a very few hours the clear spaces will become reddened and a great proliferation of the blood-vessels will be seen throughout the entire omentum. When it is remembered that these blood-vessels are the means of the pouring out of countless leukocytes, the protective cell of the peritoneal cavity, the importance of the quick response

* Read before the Philadelphia Obstetrical Society, October 1, 1908.

of the omentum to inflammatory stimulus will be realized. After the injection of a fine granular material into the peritoneal cavity of an animal, the author has often observed two or three such granules in the substance of a leukocyte or a number of leukocytes surrounding a large granule. The same thing takes place when microorganisms are introduced into the peritoneal cavity. The leukocytes swarm to the point of invasion and a combat between the leukocytes and the microorganisms immediately takes place. In addition to the numerous blood-vessels in the omentum, many lymphatics are found. These can be beautifully demonstrated with a hypodermic needle and a solution of Prussian blue, when it will be found that, apart from their angular shape and peculiar beaded appearance, they are very similar to the smaller blood-vessels. There is little doubt that from these lymphatics is poured out the greater part of the peritoneal fluid and that without them peritoneal absorption and drainage would be at a stand-still. It is doubtful if any, or at all events much actual absorption takes place through the omentum. Its function is to pour out fluid which washes through the peritoneal cavity and is finally absorbed through the diaphragm.

No surgeon can have failed to notice the variability in size of the great omentum. In some individuals it is a heavy apron extending to the pelvis, while in others it is represented by only a scant ribbon of tissue hanging from the border of the stomach. It might be argued from this fact that a patient with a large omentum should stand a better chance to combat a peritoneal infection than a patient with a small omentum, and this is very likely true although I have not been able to find any actual facts to corroborate this theory in the literature of the omentum or in my own work. It should, however, be remembered that although the omentum majus is quite variable in size, it constitutes but a comparatively small part of this highly specialized peritoneum. The gastrosplenic and gastrohepaticomenta are both very constant and vary but little in size and are, if anything, even more highly specialized than the omentum majus.

The question whether the omentum has in itself any inherent power of movement is a mooted one. Some authorities claiming that it has, basing their assertion on the fact that the omentum is usually found adherent to inflammatory structures in the peritoneal cavity. These authors are inclined to endow the

omentum with a jelly-fish-like movement. As a result of a large series of experiments, some of which were performed with this special object in view, the author has failed to demonstrate any inherent properties of movement in the omentum, and believes that its change in location in the abdominal cavity is a result of peristaltic movements of the intestines and changes in intraabdominal pressure, as instanced by the bulging out of the omentum in laparotomy wounds as soon as the peritoneum is incised. Moreover, histological studies fail to show any muscular tissue in the omentum except that found in the blood-vessel walls. Moynihan says that when a penetrating wound of the intestine or stomach is small—such a wound as is produced by a narrow knife-blade or by the modern high-power military rifle bullet—there is an immediate prolapse of the mucosa of the gut, temporarily sealing the wound. But when the wound is large and the damage is of such a character as to produce a local stunning or paralysis of the bowel, the omentum is likely to block the opening. This, the author believes, is due to changes in intraabdominal pressure; but however the result is obtained, the benefits derived from the omentum in such cases is very great. There is little doubt that the mortality following operations for ruptured typhoid fever ulcers, high as it is, would be much higher if it were not for the omentum. The ability of the omentum to wall off appendiceal abscesses and collections of pus and blood in the pelvis is too well known to need comment. It would be interesting to know exactly how quickly this process of walling off takes place. Yates has shown that the formation of peritoneal adhesions are the work of but a few hours, and this had been confirmed by our own experimental work.

It is a common custom among abdominal surgeons at the completion of an operation to draw the omentum down between the wound and the intestine for the purpose of preventing post-operative adhesions to the latter. This procedure has much to recommend it and is of special value in these cases in which there has been considerable trauma to the omentum. It seems probable, however, that if the omentum were in a fairly healthy condition that it would soon resume its normal position in front of the intestine without operative intervention.

Murphy has recommended that in cases of intestinal anastomosis a part of the omentum be grafted over the line of the sutures. The author believes that if intestinal sutures were properly placed, they will be sufficient in themselves and that an additional

layer of omentum over them will be of but little avail if the intestinal sutures give way. Cases may, however, arise when this procedure will be of value. Beyea has recommended pleating the gastohepatic omentum for the purpose of suspending the stomach while coffee has utilized the omentum as a hammock for the suspension of the transverse colon.

Under the heading of adhesions it may be well to emphasize the fact that omental adhesions should not be indiscriminately broken up, but whenever possible should be ligated and cut. The reason for this is the peculiar blood-supply of the omentum which, apart from being very rich in blood-vessels, is almost devoid of capillaries, the circulation being carried on chiefly by means of direct arterial and arterovenous, anastomosis, and unless care is taken to ligate all blood-vessels serious hemorrhage may result.

It has been suggested that in certain liver diseases, notably cirrhosis, that the omentum be stitched to the anterior abdominal wall with the hope of increasing the blood-supply of the liver and thus arresting the process of the disease. The operation has not proven so successful as it was hoped, probably; for one reason, that the exciting cause of the disease was not checked.

So far we have viewed of the omentum as the friend of the surgeon; it will however, occasionally be found the seat of pathological lesions. With the exception of inflammations, which are usually secondary to inflammation in other parts of the peritoneal cavity, the omentum is rarely found diseased. Primary tumors of the omentum are very infrequent. Cysts, fibromata, lipomata, sarcomata, and carcinomata, have been found; the latter tumor is by far the most frequent.

During the last year or two, a number of cases of torsion of the omentum have been reported. Richardson divides torsion into three classes (1) Torsion of the omentum within a hernial sac. (2) Torsion of the omentum within the abdomen. (3) Torsion of the omentum within a hernial sac combined with an intraabdominal torsion. Adhesions are without a doubt the chief predisposing factor toward torsion. The symptoms as reported are very similar to those of acute appendicitis or intestinal strangulation. Up to the present time about sixty odd cases of omental torsion have been reported. Of these but a small percentage have been correctly diagnosed before operation. The most frequent symptoms are nausea, vomiting, pain, collapse and the presence of a tumor. These, especially if combined with a history of previous inflammation within the peritoneal cavity, should at least lead

to the suspicion of the condition. Fortunately, the correct diagnosis is not of vital importance, as the treatment for it and for the condition for which it is most frequently mistaken, is the same—viz., operation.

If the omentum is routinely examined during the course of every abdominal operation, irregular openings or windows will often be found in it. These are in some cases the result of previous inflammation and in other cases are due to atrophy, the latter condition, as a rule, produces but small openings. Such holes in the omentum if of large size should be closed, as a number of cases have been reported where an intestine has prolapsed through such an opening and become strangulated.

Occasionally a very large omentum containing a great amount of fat will be met with. Such an omentum may cause trouble by dragging on the stomach and colon. Gastric irritability, nausea, vomiting and other symptoms of indigestion may result from the former, while the excessive weight of the omentum may produce or act as an etiological factor in causing a ptosis of the latter. The author has recently seen a case of retroversion of the uterus where the pelvis was filled with a very large, heavy omentum which wedged the uterus in its posterior position so firmly that, although there were no adhesions present, it was impossible, before operation, to manually replace the uterus in its normal position. In such cases a partial omentectomy should be performed, the omentum being amputated at about the level of the umbilicus.

A review of the recent literature on the physiology of the omentum should lead the surgeon to look upon this organ as a great aid in abdominal surgery. When, during a course of an operation, it is found necessary to remove a portion of the omentum, as little as possible should be excised, except, of course, when a malignant condition is present. It is well to remember that an inflamed omentum may under favorable conditions return to the normal.

THE TREATMENT OF POSTPARTUM HEMORRHAGE.*

BY

J. CLIFTON EDGAR, M. D.,

New York.

AN excuse for presenting this time-honored subject to the Obstetrical Society, this evening, is that postpartum hemorrhage even in well-regulated maternity hospitals occurs in about five per cent. of all cases. In general it occurs in a mild form once in fifty labors; is severe once in 1000, and fatal once in 5000.

I found in 2200 cases of confinement, 800 of which were cared for by students in the tenement houses, and the remainder by internes in a hospital, that postpartum hemorrhage occurred in 104 cases, or 4.72 per cent. This included mild, severe and fatal cases. The frequency of the accident in hospital and tenement house practice was about the same. Of these cases the accident was twice as frequent, as one would expect, in multiparæ as in primiparæ; one quarter (25.96 per cent.) of the hemorrhages occurred before placental delivery; about a half (62.50 per cent.) after the completion of the third stage, and a smaller proportion, namely 11.53 per cent., took place both before and after delivery of the placenta.

The rather frequent occurrence of the accident in these 2200 cases was undoubtedly due to the too common employment of forceps delivery, and to the mismanagement of the third stage of labor.

In the consideration of the treatment of postpartum hemorrhage we accept the definitions that postpartum hemorrhage is hemorrhage from any portion of the parturient canal after delivery of the fetus; that *postpartum hemorrhage proper* is only from the placental site; that it is *primary* or *immediate* when it occurs within twenty-four hours after the expulsion of the child; that it is *secondary* or *remote* when it takes place at any time during the puerperium subsequent to the first twenty-four hours. *Internal* or *concealed* and *external* or *open* are two recognized types, and while the true form is from the placental site, the bleeding may be from the cervix, vagina or the pelvic floor. Another reason for bringing the treatment of this accident of childbirth to your notice is that although the general principles

* Read before the New York Obstetrical Society, October 13, 1908.

of the treatment are pretty universally accepted, still there is rather a wide difference in the manner and sequence of the applications of these principles. Of the preventive and curative treatments of postpartum hemorrhage, the former should take a prominent place because the accident is usually, but not always, as stated by some, preventable. Pregnancy toxemias, albuminuria, leukocythemia, alcoholism, causes of obstructed venous return resident in the liver, lungs or heart can be treated and possibly partially remedied, so that the nervous, muscular and circulatory system are put in as good a condition for labor as may be, but they cannot always be cured or even improved in the time allotted, and we must make the best of the conditions present after the completion of the first stage of labor. Those who have seen much of hepatic pregnancy toxemia, will I believe accept the statement that where jaundice has persisted over a considerable period, the blood state induced renders postpartum hemorrhage especially obstinate. The questions of delay in instances of a too rapid delivery and of interference in protracted labor are often delicate ones for the attendant to decide as preventive measures.

The advisability of the administration of ergot, as a preventive, at the completion of the third stage, is still an unsettled question in obstetrics. Those who are against its routine use raise the cry "no medication without a positive indication." They ignore the fact that postpartum hemorrhage occurs in about 5 per cent. of all cases. I am frankly in favor of ergot at the completion of the third stage as a routine in all cases. As chloroform or ether are in almost universal use to a lesser or greater extent during the second stage, and as after their use uterine contraction is not as positive and prompt as one would wish it, ergot after confinement counteracts this tendency to relaxation. Ergot used after the uterus is empty is useful as a preventive not only of hemorrhage, especially in multiparæ and atonic cases, but of sepsis, and after-pains, and as an aid to involution. One, two or possibly three doses of ergot in the beginning of the puerperium does not effect one way or the other the function of lactation. On the one hand I know of no valid objection to ergot thus used after confinement, and, on the other, the drug adds in my opinion to the safety and comfort of the patient. For essentially the same reasons I favor a proper fitting abdominal binder.

Undoubtedly the most important factor in the preventive

treatment of postpartum hemorrhage is the proper management of the third stage of labor. Even a moderate experience in the teaching of internes, students and nurses will convince one of the lack of uniformity that exists in different parts of this country and Canada in the management of the uterus during the third stage and immediately afterward. The principles of uterine contraction are often entirely lost sight of, and there is often entire ignorance of the method of grasping and holding the fundus of the uterus after the manner proposed by Cr  d   in 1853 for placental expression, and which, in my opinion, has never been improved upon.

It would be well that every student and nurse were required to commit to memory the words of Cr  d  's original account of his method. Instead of rubbing the fundus and corpus uteri through the abdominal wall, and as soon as uterine contraction has reached its maximum of grasping the uterus entire in such a way that the fundus lies in the palm of the hand while the fingers and thumb make gentle pressure, the former behind the fundus, and the latter in front, one often observes massage being made just above the pubis, without any thought of the actual location of the fundus in a relaxed and enlarged uterus, and on the other hand, one sees attempts at uterine compression in which the whole uterine body is pressed back against the sacrum, without any attempt at grasping the fundus uteri between the fingers and thumb. Unless there is actual uterine relaxation or hemorrhage after the expulsion of the child, the hand as a sentinel is placed about the fundus, and the latter lightly grasped; but no attempt should be made to actually deliver the placenta for thirty minutes. I am a great believer in this period of expectancy being made to consume at least half an hour and I am inclined as I have more and more experience to prolong it even to a longer period. Prolonging this period allows the uterus to rest, contract and possibly retract in preparation for the climax of the third stage. A too early application of the Cr  d   method interferes with nature's mechanism. Prolonging this period further allows clots to form in the sinuses of the detached areas of the placental site and permits of a gradual and natural separation of the placenta. Cutting short the period of rest militates against these desirable conditions.

Sharp hemorrhage taking place, whether the placenta be attached or separated, calls for active Cr  d   expression followed by rather vigorous fundal massage to cause and maintain uterine

contraction and retraction. The introduction of the fingers and possibly the whole hand into the uterus may be necessary to separate a wholly or partially adherent placenta. A syringefull of aseptic ergot injected into the thigh at this time is of great aid in inducing uterine contraction. Except in instances of adherent placenta or retained blood-clots the introduction of the whole hand into the uterus to control hemorrhage is rarely called for and is to be discouraged. In an emergency the bimanual compression of the emptied uterus, the vaginal hand grasping the cervix, and the hand on the fundus forcing the latter downward and forward against the symphysis, thus tending to occlude the uterine blood-supply is sufficient. At the same time the ulnar surface of the fundal hand slips backward to compress the abdominal aorta and vena cava. This is always a ready method to hold the bleeding until preparations to administer a hot acidulated intra-uterine douche or to pack the uterine cavity can be made. I have rarely found it necessary to resort to the bimanual compression of the uterus proposed by Gooch, whereby the hand in the shape of a fist is introduced into the uterine cavity and this is grasped by the other hand through the anterior abdominal wall and the uterine walls compressed between the two hands. My objection to this last method is on the ground that by its use air is liable to be introduced into the open venous sinuses, especially should the hand be withdrawn from a uterus in a state of relaxation, which is apt to be the case. Moreover, the thin relaxed uterine walls are readily ruptured by this method. I have been using it less and less in recent years, substituting the method of uterine compression proposed by Breisky. Much harm has been done in the past by the routine introduction of the hand into the uterus in these cases. In the majority of instances, after emptying the uterus, fundal massage and hot acidulated vaginal or intrauterine irrigation are successful remedial agents; therefore these should be given first place. Bimanual uterine compression and uterine tamponade may follow in rational sequence. After control of the hemorrhage the subsequent treatment of the anemia, shock, and the emptied blood-vessels, is the same as after any surgical hemorrhage. Heat, stimulants, rectal or intravenous infusion or hypodermoclysis have their place as the conditions may call for them. Adrenalin added to the intravenous infusion is apparently a valuable adjunct.

As in primary, so in *secondary* postpartum hemorrhage, the

most satisfactory treatment is the preventive treatment. The lying-in woman should be protected against 1. Mental emotions; 2. Disturbances of the general circulation, and 3. Blood conditions that might cause hemorrhage during the puerperal state. If the third stage of labor, as well as the first few days of the puerperium, are carefully managed, the four main causes of secondary postpartum hemorrhage will be avoided. These are: 1. The retention of placental tissue; 2. The retention of membranes; 3. Of blood-clots, and 4. A distended bladder or rectum. The patient should not be allowed to assume the erect position until involution is well advanced and sexual intercourse should be prohibited for two months. The curative treatment of secondary postpartum hemorrhage as in primary hemorrhage consists in 1. Making sure that the uterus is completely emptied, and 2. In securing complete uterine contraction.

A vaginal examination should always be made, and if the cervical canal allow it, the uterine cavity explored and any retained material removed. If the cervical canal will not allow of the passage of the finger, and the hemorrhage persists, the canal must be dilated and any retained material removed. Contraction is then secured by hot vaginal or uterine irrigation, swabbing the uterus out with acetic-acid solution and the subcutaneous injection of aseptic ergot. Two widely different types of secondary postpartum hemorrhage have recently come under my observation. The first is a common type, possibly the most frequently seen. A few weeks ago while operating in a hospital in the middle of the night, word was brought up to the operating room that a patient in the puerperal ward was having a severe hemorrhage. The case proved to be a primipara, seven days postpartum after an ordinary confinement. Up to the time of the hemorrhage the puerperium had been uneventful, with a moderate lochia and no after-pains. The hemorrhage, which consisted of about twelve ounces, came on suddenly during sleep. A digital exploration of the uterine cavity removed a piece of placenta the size and shape of the thumb. Its removal and a hot saline intra-uterine douche caused the hemorrhage to cease, and the patient had no recurrence. The second case is of quite another type. During the summer I was telephoned for from Bangor, Maine, to see a severe case of postpartum bleeding. I arrived there fourteen hours later and found the following conditions: The patient had two and a half weeks previously been delivered of her second child, in an ordinary, uncomplicated confinement.

At the end of the second week of the puerperium, suddenly and unexpectedly the patient had a severe uterine hemorrhage to such an extent that her life was for a time despaired of. This was finally controlled by the usual methods, and as soon as practical a thorough exploration of the uterus was made. This was negative except that a softened and thickened area of the anterior uterine wall just above the cervix could be made out. Scrapings of this area were secured for microscopical examination. The uterus was not at this time packed with gauze. Two days later the patient suffered from another severe hemorrhage. For this a uterine tamponade was used. I saw the patient the day following, and after removing the uterine tamponade found the conditions just described. In the meantime a negative report on the uterine scrapings had been received. Believing that a third hemorrhage in the patient's bloodless condition would cost her her life and in view of possible malignancy, I urged an early removal of the uterus. This was done the following day by Dr. Morris Richardson, of Boston. The uterus was sent to a pathologist in Boston. The patient made an uneventful recovery and is now on a camping trip with her husband in the Maine Woods.

The following is the pathological report upon the removed uterus:

HARVARD MEDICAL SCHOOL.

BOSTON, *July 30, 1908.*

DEAR DR. RICHARDSON:

The specimen from Mrs. W. C. (T. 87-22), July 23, consisted of a uterus the walls of which were thickened and the cavity dilated and roughened.

Microscopic Examination showed the interior without any mucous membrane, and with here and there fibrinous exudations and infiltration of round cells.

Diagnosis.—Chronic endometritis.

Yours very truly,

WM. F. WHITNEY.

28 WEST FIFTY-SIXTH STREET.

THE TREATMENT OF ACCIDENTAL HEMORRHAGE
AND PLACENTA PREVIA.*

BY

GEORGE L. BROADHEAD, M.D.

New York.

THE term "accidental hemorrhage," as familiarly understood, conveys the idea of bleeding from the site of a normally situated placenta. Hemorrhage may be entirely visible or concealed, or there may be a varying amount of blood within the uterus, accompanied by external bleeding. The treatment will depend upon the severity of the hemorrhage. In the very mild cases, absolute rest in bed, the use of small doses of morphine, and careful nursing, will frequently give results as favorable as those following similar treatment for threatened abortion.

Should bleeding continue, or be more severe from the onset, the uterus should be emptied slowly or rapidly, according to the amount of blood loss. When hemorrhage is not free, we believe that the induction of labor by means of the modified Champetier de Ribes bag is the best plan of treatment. The cervix can be dilated, if necessary, by the series of bags, after which the child may be extracted by forceps, version, or craniotomy if the child is dead. Should hemorrhage be profuse, the cervix must be dilated quickly by the fingers or Bossi dilator, or be incised if necessary, then version performed, the extraction of the child following immediately after. When the blood loss has been large, the uterus should be packed with gauze as a routine procedure.

PLACENTA PREVIA.

Placenta Previa may be of the lateral, marginal or central variety, and there is no one method of treatment applicable to all cases. The period of gestation, the condition of the cervix, the variety of the previa, the amount of hemorrhage, the skill of the obstetrician and the environment of the patient are all factors which must be considered in the treatment of this dangerous complication. We believe that when the diagnosis of placenta previa has been established, the patient should be advised to have her pregnancy terminated at once, the only exception to this rule being made in the case of patients who can be under constant

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supervision in a well-equipped hospital. Should the patient elect to allow pregnancy to proceed under such circumstances, the nature of the additional risk should be made clear to her, for even in a hospital subsequent hemorrhage may be fatal. Immediate intervention is the safest plan of treatment.

LATERAL PLACENTA PREVIA.

Hemorrhage during pregnancy, or the early part of labor, from the site of a lateral placenta previa, would be treated in the same manner as already outlined for accidental hemorrhage, and indeed many *so-called* cases of accidental hemorrhage are, in reality, cases of placenta previa lateralis. When bleeding occurs late in labor, after the cervix has been well dilated, the diagnosis of lateral placenta previa can, as a rule, be easily made. If hemorrhage is not profuse, rupture of the membranes *alone* will in some instances be sufficient to allow the presenting part to descend, thus causing enough compression to control the bleeding. Should hemorrhage continue, the child should be extracted by forceps or version.

MARGINAL OR PARTIAL PLACENTA PREVIA.

When the cervix is rigid and the os but slightly dilated, or when in an emergency one is unprepared for other methods of procedure, tamponade of the cervix and vagina is an excellent plan of treatment. The cervix is softened and dilated by the tampon and subsequent methods of procedure are thus rendered easier of application. For many years, podalic version by the internal or Braxton Hicks method has been the most extensively employed of all methods, and there is no doubt but that the present comparatively low maternal mortality is due in great part to podalic version.

When the cervix is well dilated, version is usually the best treatment, but in all cases when the cervix is not completely dilated, extraction must be made slowly. The lower uterine segment is very vascular, soft and easily torn and rapid extraction is certain to be followed in many instances by a rupture of the uterus. By extracting a child rapidly through an undilated cervix we must necessarily enormously increase the maternal mortality and the life of the mother should not be sacrificed for that of the child, especially as fetal mortality in placenta previa is, and probably always will be unavoidably high. Following the removal of the placenta, we believe the uterus should be packed

with gauze as a routine procedure as the surest method at our command of preventing further blood loss.

When the cervix is but slightly dilated, the modified Champetier de Ribes bag may be used to great advantage. By the use of one of the larger bags hemorrhage is controlled and after the cervix is well dilated version may be performed. This method lowers fetal mortality, as it provides for good cervical dilatation before version is performed. If bags are not at hand, we advise the use of the Braxton Hicks version, and failing in that, the cervix should be dilated with the fingers sufficiently to allow the introduction of the hand, after which podalic version, slow extraction and uterine tamponade follow.

Cesarean section for placenta previa has been advocated from time to time, but the indications for the operation, in the absence of complications such as contracted pelvis, etc., are rarely met with. If one were to meet with placenta previa, at or near term, in the case of an elderly primipara with rigid tissues, or in a multipara with a cervix full of unyielding scar tissue, Cesarean section would, no doubt, give the best results, so we must admit that in *rare selected* cases, in the hands of *skilled* obstetricians, the operation may be used to advantage.

Holmes, in a paper entitled "Cesarean Section for Placenta Previa an Improper Procedure," published in the *Journal of the American Medical Association*, May 20, 1905, goes into the subject exhaustively, and objects to the operation on a number of grounds. He states that in twenty-five cases of Cesarean section for placenta previa, the maternal mortality was 20 per cent. and the ultimate fetal mortality (at the end of two weeks) 64 per cent. These figures compare very unfavorably with his maternal mortality of 3.3 per cent. in 1029 cases published by a number of modern obstetricians, and with a maternal mortality of 7.36 per cent. in a total of 2756 cases treated in the antiseptic period; while the fetal mortality in nearly 2000 cases treated by the usual methods was 54 per cent. Published reports, therefore, would seem to show that the Cesarean operation should be rarely used, and indeed, as Holmes points out, the operation to be very successful should be done as a primary procedure before other measures have been tried.

CENTRAL PLACENTA PREVIA.

Probably the most frequent and generally useful plan of procedure has been to force the hand through the placenta, seize

a foot and perform a podalic version, following this by extraction and uterine tamponade. Holmes collected 350 cases of central placenta previa reported by modern obstetricians with a maternal mortality of 13.4 per cent., the fetal mortality being 80 per cent. Section for central placenta previa has been more successful, as Holmes collected nine cases with a maternal mortality of 11 per cent. and an ultimate fetal mortality of 44 per cent. Miller, of Pittsburgh, has treated fourteen cases of the central variety by preliminary ligation of the uterine arteries. His technic is to ligate the artery on either side, through the vagina, and then, having controlled hemorrhage, he proceeds slowly to deliver. Two of his fourteen cases were so profoundly anemic when first seen that they died a few hours later, but the other twelve patients made good recoveries.

In only four of the fourteen cases was there any evidence of fetal life; in three of these the children were born alive, but all died of prematurity within forty-eight hours. Miller claims that the operation is simple, performed in some cases without anesthesia, does not decrease the possibility of future child bearing, controls the hemorrhage, allows the operator to proceed slowly and carefully to dilate the cervix and empty the uterus, and he also claims that the ligation prevents postpartum hemorrhage. He states that while fetal mortality may be slightly increased, there should be *no maternal* mortality except from sepsis. The method is ingenious, and while we have had no experience with the procedure, we mention it as an effective original means of treating central placenta previa.

144 WEST 58TH STREET.

CYSTOCELE.*

BY

I. S. STONE, M. D.,
Washington, D. C.

THE operation which has been most successful for the relief of cystocele is that which has for its object the liberation and elevation of the bladder from its prolapsed position to a new or higher position in the pelvis where it has additional support from the strong layers of pelvic fascia to be found between the vaginal wall and the bladder itself, and also a new support from the uterus upon which it is elevated. Various methods of accomplishing this purpose have been exploited and have been more or

* Read before the American Gynecological Society, May, 1908.

less successful, because they have to a greater or less degree involved a complete separation of the bladder from the vaginal wall or uterus or both. Some of the writers have used the word "uterine interposition" for the purpose of explaining the new position of the bladder which is placed upon the uterus, which in turn is generally secured to the anterior vaginal wall: "vagino-fixation." The former operations for cystocele which depended for a denudation of the vaginal wall have, we believe, generally been abandoned by operators, and even the very conservative surgeons who do not use the modern flap-splitting operation obtain a thorough exposure of the fascia by cutting away the vaginal wall, although they do not make a separation of the bladder from the uterus or vagina.

Among those who soon recognized the inefficiency of the former methods we find our countryman, Hadra¹, of Texas, (1895), who introduced the theory of prolapse of the bladder and vagina due to a separation of the vagina from the cervix uteri.* He says: "The cervix is firmly grasped with a strong "vulsellum" on the posterior lip, and dragged down to a convenient extent. On the brim of the anterior lip, about a quarter of an inch distant from the os, a crescentic incision is made through the vaginal cover and carried up on each side of the cervix for one or one and a half inches, according to the amount of slackening. The vaginal flap is then lifted up from the cervix by finger or blunt instruments until it can be pulled well upward toward the roof of the vagina and enough to undo the pouching; in other words, until the cystocele disappears. If the flap be too long and flabby, a transverse piece may now be resected, then the reattachment has to be made. The operator puts his index-finger between the denuded cervix and vaginal flap as high up as possible, in order to lift the bladder out of the way, and while an assistant is pulling the cervix down by the vulsellum, a disinfectant silk suture is inserted, tacking the vaginal flap to the cervix in a transverse line. Then the wound is closed. This proceeding simply reunites the detached vagina to the cervix and does away with the cystocele." Hadra is silent regarding the separation of the bladder from the uterus or vagina.

Winter (1896) seems to use a method somewhat similar to that of Hadra, and in addition detaches the bladder from the anterior vaginal wall.

*He illustrates his article with two cuts which show the pathology as he found it, or as it appeared to him.

Separation of the bladder from the vagina was practised by Kreutzmann² prior to 1896 as a step in the operation of hysterectomy for prolapsus uteri and cystocele. He made a complete separation of the bladder from the vagina "far back on the sides and from the uterus." Large flaps were removed from both sides of the vaginal incision and the wound carefully closed with silkworm-gut. His patient had uterine and bladder prolapse and he removed the uterus as a part of the operation for the cure of the cystocele.

Sänger,³ of Leipzig, appears to have been the first to report an extended experience with what he calls "Lappenspaltung," or flap-splitting. His method was certainly a distinct advance and he reinforced his position in subsequent papers (1898).⁴ Sängers approves of bladder separation from the anterior vaginal wall, but opposes the more radical method of separation of the bladder from the anterior uterine wall.* Sängers mentions Arx⁵ as a pioneer in the use of a method similar to his own which we find in the *Korrespondenz-Blatt für schweizer Aerzte*, Basle, 1896 (same, 1897).⁶

Arx anticipated some descent of the uterus and practised cervix amputation, along with bladder separation from the anterior surface of the uterus, in his operations for cystocele. He does not entirely open the space between the bladder and uterus; or, in other words, leaves the peritoneal reflexure unbroken. While the author of the above method appears to have been the first writer to mention this feature of the operation for cystocele ("cystocele elevation")—and he has Sängers's word for it—still we find that he (Arx) says that Gersuny did identically the same thing and that he did it independently of him.

In addition to bladder separation, Gersuny⁷ offers a modification which we recognize as adapted from Emmet or Stolz; *i. e.*, an inversion of the bladder by purse-string suture of its base after separation from the vagina. He elevates the bladder by turning its mucosa upward ("Einstülpung") into a ridge or cone within the bladder, leaving its interior basal portion as in the operation proposed by our honored compatriot, Emmet. Difference is, however, at once apparent, for he first separates the bladder from the anterior vaginal wall, then excises the long flaps and unites the free edges after the bladder has been

*Sängers says, "Auch bei der Hadraschen und v. Arxschen Operationen welche ich sonst für wöhl durchdacht und rationell ansehe, wird wöhl ebenfalls das Cololum durch den Narbenzug stärker nach vorn dislocirt werden, wie auch bei allen misslungenen Vaginifixuren."

treated by its inversion and suture as above stated. The experience of this writer (Gersuny) has been like that of the author: he thought himself a pioneer when he first performed and reported his operations. He was, however, corrected by Sanger himself.

Mackenrodt⁸ not only has the honor of the "vagino-fixation" operation associated with his name, but he has also described his modification of the operation as applied to cystocele.

By the method of Wertheim⁹ (reported in 1899), a transverse incision is made over the cystocele, and the bladder is separated as usual from the uterus and anterior vaginal wall. The vaginal flaps are incised and the uterus is drawn into the vagina and there made fast; posterior uterine, to the anterior vaginal wall. The cervix is left free. The operation is called "intro-vaginal vagino-fixation." (Wertheim claims 93 $\frac{3}{4}$ per cent. cures.)

In a recent periodical (Gyn. Rundschau), Schauta¹⁰ tells us that he calls this operation "interposition" of the uterus between the vagina and bladder. He discussed the subject in the Wiener gynak. Gesellschaft, *vide* Trans. Marz 21, 1899. He does not always recommend entire separation of the vesico-uterine fold, but prefers the extra-peritoneal method. He amputates the cervix if necessary, but is not inclined to make this a rule. He has used "the extra-peritoneal vagino-fixation interposition method since 1889 in at least ninety cases without modification." He declares the method is identical with that of Mackenrodt, Steinbuchel and Lott. In the severe cases he opens the plica anterior and elevates the bladder upon the uterus, which in turn is imbedded between the vaginal wall and bladder.

The technic of Duhrssen¹¹ in the treatment of prolapse of the uterus and bladder was announced in 1901. He practised this method in 1894, and gives Schucking¹² the credit for the suggestion that vagino-fixation would cure prolapse. He includes the cystocele or prolapse of the bladder with that of the uterus and his method which is similar to that of Schauta, Wertheim and others, involves the following:

1. The resection of the excessive vaginal portion.
2. The making of a firm pelvic floor.
3. The restoration of the normal size and position of the uterus.
4. An appropriate treatment of the cystocele.

The operation is very similar to that practised by many American surgeons, except in being an intra-peritoneal operation.

The space between the bladder and uterus is opened widely and the uterus is then brought forward under the bladder and sutured to the vaginal wall. If the uterus is large and the cystocele small, it will be impossible to close the vaginal wall over the uterus as shown in the Operative Gynecology of Döderlein-Krönig. It is, therefore, very important not to cut away vaginal flaps until the uterus is placed in its new position and the flaps tentatively placed over the fundus and anterior wall.

We find that elevation of the bladder has been extensively tried by some French surgeons. In 1889 and 1890, Vlaccoz, Dumoret, Tuffier, and Laroyenne used a method of "cystopexie." Laroyenne¹³ dilated the urethra and introduced his finger into the bladder as the sutures were applied. The operation was essentially like a suspension of the uterus, "hysteropexie" or "cysto-hysteropexy."

Other French operators used methods very similar to that of Mackenrodt, as Villa,¹⁴ Aubeau,¹⁴ and Delbet.¹⁴ The latter performs hysterectomy and then uses the round ligaments to serve as suspensors to aid in supporting the vaginal walls and pelvic viscera.

Delanglade,¹⁵ treats cystocele by resecting the pelvic diaphragm: "Myorrhaphie a été faite en avant et au-dessus du vagin, en arrière et au-dessous de la vessie." He uses a transverse incision of the anterior vaginal wall, separates the bladder from the vagina and then resects the vaginal flap. The flap-splitting method has been used by Pozzi, Quenu, Jacobs and many others, but the literature shows that the French surgeons make less use of the method than the Germans.

We also note the operation as announced by Alexandroff¹⁶ in 1903. This operation is intended for the relief of retroversion of the uterus and for prolapse of the uterus and bladder. The vagina is opened in the median line, the bladder separated from the uterus, but the peritoneal cavity is not opened. The operation is entirely extraperitoneal. The ureters are elevated and the broad ligaments with the parametrium are brought forward in front of the uterus and secured in such a manner as will take up the slack in both ligaments and vaginal wall. The author claims that the cervix is drawn upward and backward, which, if true, is a most desirable result. Tweedy¹⁷ describes a similar method. He opens the space between the bladder and the uterus after separating the bladder from the vagina. Douglas' cul-de-sac is now opened and the broad ligaments are hooked with

the finger and brought forward and sutured in front of the uterus. The "ligamentum coli transversalis" of Mackenrodt is utilized in this way and it is claimed by the author to have given a substantial support to the uterus and bladder. The union of the ligaments to the cervix is made just above the portio as the author amputates the cervix and finally secures the fundus to the anterior vaginal wall. It is taken for granted in the above methods that the authors resect the vaginal flaps before concluding the operation.

Dr. E. Reynolds,¹⁸ of Boston (1902 and 1907), has made use of the same principle as used by Alexandroff and Tweedy, in which the cervix is drawn upward and backward. The operation is entirely completed without separation of the bladder from the vaginal wall or uterus, it being possible, in the author's opinion, to accomplish the elevation of the cervix and the bladder without the more radical operation.

One of the first American operators to separate the bladder from the uterus for the relief of retroversion and cystocele was Watkins,¹⁹ of Chicago (1899). "The uterus was curetted and separated from the vagina by a circular incision. The bladder was separated from the uterus by blunt dissection and the peritoneal cavity opened in front of the uterus. The anterior wall of the uterus was grasped by bullet forceps and the organ anteverted. About two inches of the upper portion of the anterior vaginal wall was excised. The anterior vaginal wall was now sutured to the upper border of the broad ligaments lateral to the uterus, and to the fundus of the uterus with silk-worm-gut sutures. The posterior vaginal wall was incised, longitudinally in the median line, from the cervix downward about one inch, so as to allow the cervix to be displaced upward and backward. The wound in front of the cervix was now closed by silkworm-gut sutures inserted transversely; that is, parallel to the line of incision anterior to the cervix." The operation was concluded by passing a suture through the posterior lip of the cervix and the incision in the posterior vaginal wall. Watkins,¹⁹ like many others, acknowledges the use of the vagino-fixation principle in his operation (see page 422, line 4 from bottom). In a recent communication, Dr. Watkins says his views have not changed very much since writing the paper on his cystocele operation. He has had three cases where trouble resulted later from a protrusion of the fundus uteri. He has been disappointed with shortening of the broad

ligaments in front of the cervix, although he believes that the lower segment of the uterus and the broad ligaments can be saved and used to a great advantage in closing the hernial opening through which the bladder is prolapsing. In extensive cases he amputates the fundus and occasionally dissects out the entire endometrium.

In the writer's²⁰ first paper (read December 7, 1899), he begins the description of his method as follows: "The crescentic incision is made over the cervix as in beginning vaginal hysterectomy. The bladder is pretty widely separated from the uterus and broad ligaments, and the edge of the incised vagina sutured to the anterior surface of the uterus as high as the insertion of the round ligaments, if possible." We then proceeded to further elevate the bladder upon the fundus through an abdominal incision and also to make ventral fixation of the uterus if necessary. (In this article we also acknowledge our indebtedness to Mackenrodt for the suggestion of his operation called "vaginofixation," which all agree was the immediate forerunner of the improved operation for cystocele.)

The ease with which the bladder was separated from the uterus in vaginal hysterectomy soon led to an extensive detachment of the bladder from the vagina, and the author's papers of 1901 and 1902 show the changes in technic. The preference now is for the "interposition" operation, much like that of Dührssen and Schauta, save in the cases requiring an abdominal section, in which we use a ventro-fixation to supplement the Säger operation.

Dr. Goffe,²² of New York, has been using a modified Säger operation since early in 1902 and has published two papers upon the subject in which he describes his technic. It appears to be an amplification of former work by other operators. His theory of the bladder supports includes the utero-vesical and vesicopubic and other ligaments, and he attaches great importance to their function. Dr. Goffe calls this "Nature's plan."

OPERATIVE RESULTS.

Several authors have reported their operative results, and while nearly all of this information is from foreign sources, it is because the method has not been widely used in this country. Baatz²⁵ (Berlin, 1904) reports thirty-eight cases in which retroversion associated with cystocele was treated by vaginofixation.

After three years thirty-six, or 94.7 per cent., were successful as to the position of the uterus, with twenty-nine, or 76.3 per cent., vaginal prolapse cures. Herr Baatz mentions 144 cases of prolapse and retroflexion treated since 1899, seventy-five of which showed no defects four years afterward. In thirty-three operations after Schauta's modification of the Wertheim "interposition" operation, only one case of uterine displacement had returned and one possible return of a bladder prolapse after an interval of from five months to two years after operation. (See discussion of paper of Baatz by Herr Fuchs, of Danzig, same journal).

Theilhaber²⁶ obtains 92 per cent. of cures.

Baum,²⁷ in "Die operative Behandlung der Scheide and Gebärmutter Vorfälle," says that slight prolapse gives 71 per cent. and the severe cases only 66.6 per cent. of absolute cures.

Martin,²⁸ A., shows 82 per cent. and later 93.1 per cent. of cures in private work.

Sheib,²⁹ who has made some effort to ascertain the relative number of recurrences after the former methods used by gynecologists in operations for cystocele, says from 21.4 per cent. showed a return in favorable cases, as in women under thirty years of age. In those over thirty and under fifty, 34.8 per cent. and over fifty, one-half, or 50 per cent. had relapses.

Cohn had 96 per cent., Kauffmann had 94.2 per cent., Hohl,³⁰ Olshäusen Clinic, had 88.5 per cent., and Andersch, including all operations, had 92.6 per cent. of cures after antefixation, in which the uterus remained in position, but the vaginal prolapses were not quite so satisfactory.

Andersch had 85.2 cures of vaginal prolapse; Hohl had 77 cures of vaginal prolapse; Hohl (of the Frauenklinik, Halle) reports sixty cases cured, occurring from 1894 to 1897, in which vagino-fixation was done for associated retrodisplacements of the uterus and vaginal prolapse. The bladder decensus cases were all found in excellent condition.

Herff³¹ (Halle), in "Ueber die Dauerresultate der Prolapsoperationen," says he obtains 34 per cent. of absolute cures in the ordinary anterior and posterior colporrhaphy. In vagino- and vesico-fixation he obtains 22.5 per cent. of absolute cures, but 73 per cent. of relative cures.*

*This writer had seven deaths in 137 operations upon the pelvic organs in which plastic work was done, and we think there was a complication of operations and conditions which should not be considered as properly belonging to the statistics of uterine and bladder displacements.

Andersch³² (Pffannensteil, Breslau Klinik). Eighty-nine cases. Vagino-fixations with plastic work upon anterior and posterior vaginal wall, seventy-one cases. Of these fifty-seven showed perfectly satisfactory results. Thirteen had a slight return. One was a failure. The ordinary plastic operations are reported as very satisfactory in this clinic, namely, anterior and posterior colporrhaphy with amputation of the portio, showing eleven out of twelve cases to have been cured.

Asch³⁴ reports sixteen cases, showing thirteen absolute cures in vagino-fixation; one slight return; two bad results. He says the results of plastic and fixation methods combined show 80 per cent. of cures. His experience appears to favor a combination of Alexander operations with plastic work which gives him 92.45 per cent. of permanent results. Pffannensteil³⁴ has had a large experience with an operation similar to that of Schauta. He reports (page 493) 268 cases showing 147 firm, and 121 lightly fixed prolapses ("losen fixations"). All of these operations, however, are classed as good results.

Professor Martin, in his admirable and exhaustive paper read at the Würzburg Gynak. Cong., in 1903, calls attention to the operative results in many of the European clinics besides his own, which would lead us to infer that his use of the Sänger or flap-splitting method is reserved for a comparatively small number of cases. It is, however, apparently clear that he obtains most excellent results from his private work, or at least 93 per cent. of cures.

COMMENT.

The Sänger flap-splitting technic is incomparably the operation of choice in a vast majority of instances. It is simple and effective in cystoceles of moderate size, and especially when the uterus is in fairly good position. The bladder is widely separated from the vaginal wall but not from the uterus.

Drs. C. P. Noble²⁴, Gilliam²³ and Goffe²² have adopted nearly the same technic, and the writer in his 1902 paper has also reported his experience with a modification of the operation.

The operation of Arx is adapted to the severer forms of prolapse of both uterus and bladder.

The method of Gersuny, while ingenious and a great improvement upon the old anterior colporrhaphy, fails to meet with our full approval, because it turns an irregular rugæ into the base

of the bladder which our operation avoids, and it also fails to reattach the bladder higher up and farther out toward the pelvic wall. On the contrary, the infolding of his purse-string sutures leaves the lateral margins of the bladder attachments just as before. The choice between the methods of "interposition" appears to us a matter of individual preference. Personally, we approve of the Schauta technic, unless we can use the modification by ventro-fixation—utero-muscular approximation. (Scarified fundus to exposed recti with cuff of peritoneum.) Dührssen Mackenrodt, Steinbüchel and Lott³³ have each left very little to be desired when cases of extreme prolapse of the uterus are associated with cystocele. The methods of Freund, Fritsch and Wertheim do not appeal to us, for we have always succeeded in curing our patients without leaving their uteri in their vaginæ.

The method proposed by Alexandroff and those who use the base of the broad ligaments as tractors or suspensors has not been in use sufficiently long to fully test its merits.

Finally we reserve the Sänger technic for a class of cases which are most difficult of cure by any of the usual methods by vaginal narrowing or by any operation upon the ligaments of the uterus. We speak of those cases seen in old women having thin vaginal walls with large cystoceles and atrophic uteri. It is here that Hadra may have seen what he thought was a separation of the bladder from the cervix, for when the cervix is atrophied there is indeed very little of what may be called a "portio." Our operation has been repeatedly tried in these cases with far better results than has been attained by any other method. We will be confronted occasionally by such cases occurring in frail women who should not be subjected to an abdominal operation of any kind. In fact, there is nothing but plastic work to be considered, and our only resource is to apply the method which will give good results and not overtax the patient. Fortunately, many of these senile patients are no longer obliged to submit to sexual intercourse, and this enables us to supplement the elevation of the bladder by extreme narrowing of the posterior vaginal wall. We have not heard of nor seen a return of the cystocele after a completed operation by this method, and we have every reason to believe that bladder elevation will grow in favor until all other methods are supplanted by it.

The evolution of the flap-splitting cystocele operation is shown by papers named below which are given in nearly the order of their publication. After Lawson Tait and Simpson, we find

that Sanger used the name and applied the method to the treatment of cystocele and rectocele.

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STONELEIGH COURT.

INJURIES TO THE BLADDER DURING HERNIA OPERATIONS.¹

BY

R. E. SKEEL, M. D.,
Cleveland, O.

INJURIES to the bladder taking place during operation for the ordinary forms of hernia are of two distinct classes as pointed out by Bruner¹, in 1898. The first and probably least common takes place from the presence within the sac of the bladder or a diverticulum therefrom; or in the paraperitoneal form the bladder escapes along the side of the hernial sac and is injured when the latter is incised or ligated; or otherwise damaged when the

¹ Read at the twenty-first Annual Meeting of the American Association of Obstetricians and Gynecologists at Baltimore, September 22-24, 1908.

neck of the sac is dissected away from the subjacent tissues. The most common injury, however, is probably due to traction upon the sac in an effort to ligate it as high up as possible, with the result that the peritoneum passing from the bladder to the pelvic wall is dragged into the incision carrying the bladder with it, where it is either ligated, incised or torn. Only the former type should be designated as hernia of the bladder, but both types are almost universally so treated in the literature. In order to properly cover the ground the title of this paper was selected to include both classes under proper nomenclature. As an example of a true bladder hernia the following short report is appended.

CASE I.—Florence M., aged five years, was seen in consultation May 1, 1908, during an attack of acute strangulation in a hernia which has been known to be present for a year, when her mother had noticed a small hard mass in the right femoral region which made its appearance rather slowly and when first seen by her physician was not reducible. A larger swelling occasionally appeared which could be reduced. Her previous history was otherwise unimportant. For twenty-four hours she had been suffering severe abdominal pain, had vomited and the bowels had not moved with enemata. There was no abdominal distention and the small tumor had increased markedly in size and become very tender so that palpation was quite painful. Upon examination two distinct masses could be made out. The tender body was shaped like an ovary and pressure upon it started a sharp attack of vomiting. Steady compression such as is exercised upon a paraphimosis resulted in a rapid diminution of its size and after a moment or two of manipulation, it slipped back through the canal without gurgling, leaving the smaller irreducible portion outside the ring. All pain and nausea immediately disappeared and the child in a few hours was as well as ever. Two days later while the patient was awaiting operation it was noticed that the hernia became much larger when the bladder was full and diminished in size upon its evacuation. Operation showed the adherent mass to be omentum, as was expected, with a paraperitoneal bladder hernia at the inner side of the sac. The sac was ligated below the bladder, the ring merely sewed up and the foot of the bed kept elevated for two weeks. Convalescence was uneventful and there has been no recurrence up to the present time.

CASE II.—Mrs. R. M., aged thirty years, pluripara. This patient

states that for some years she has had a small swelling in the right femoral region which has been diagnosed as a hernia, and for weeks at a time has been irreducible. When irreducible it became tender and somewhat painful but not sufficiently so to incapacitate her. She has a chronic bronchitis and during exacerbations the hernia is far more troublesome. When first seen she was having one of these acute exacerbations and I was unable to reduce the hernia. Operation was done some weeks later under nitrous oxide and oxygen but the hernia had previously reduced itself. A very small empty sac was found which was so narrow at the neck as to be almost obliterated, and it was not thought possible that this could be the sac of the hernia which was felt at the earlier date. A little deeper dissection revealed a second sac situated median to the first one, thin and translucent. Both sacs were included in one ligature and cut away.

The patient was returned to bed in good condition but complained more of pain than is customary. Six hours later she was still complaining bitterly of pain which was not localized but spread over the entire abdomen and there was a little tympany. Her pulse was normal in rate, but very soft and the visible mucous membranes were distinctly too pale for a patient who had taken gas. In casting about for a solution of her rather serious appearance I remembered that several large veins were encountered in close proximity to the second sac, and immediately passed a catheter which withdrew a small amount of blood and no urine. An attempt to perform cystoscopy failed because of inability to inflate the bladder and the diagnosis of injury to that viscus was positive. Gas was again administered and a second incision through the right rectus revealed the pelvis full of blood and urine. This was sponged away and the bladder opening easily found and repaired in two layers. A drain was inserted, probably unnecessarily, down to the bottom of the pelvis and the wound closed. A retention catheter was placed and the patient made an uneventful recovery excepting for the supervention of a femoral phlebitis—a condition, by the way, which has seemed to me to occur rather frequently after this particular anesthetic. While this may have been primarily a hernia of the bladder it seemed to me quite evident that the bladder was drawn into the incision by traction upon the empty sac first found.

In the article by Bruner above mentioned all literature up to

the end of 1896 was searched, and 181 cases of bladder hernia found reported, 128 in the male, forty-four in the female with eight unknown. In the male there were 122 inguinal, two femoral and four of other less common varieties. In the female ten inguinal, twenty-seven femoral with seven of the less common varieties, and of those in which the sex was not mentioned there were six inguinal and three others. The right side presented the greater number of these hernias especially of the crural variety, there being twenty-three on the right side to six on the left. Bruner also found that very few cases of bladder hernia had been reported in patients under the age of thirty and the decade presenting the greatest number was between fifty and sixty. Of this large number thirteen were diagnosticated and treated without operation and of the whole number of operated cases, five were diagnosticated before operation. In those cases in which exact observation had been made ninety-nine were first recognized at the time of operation and in twenty-two instances the existence of bladder hernia was unknown until after operation had been completed, when later developments proved that injury to that viscus had taken place. In the ninety-nine instances in which the bladder was recognized during the course of the operation it was injured in fifty-eight or more than one-half, many times being accidentally cut or torn before its recognition: having been mistaken for the sac eleven times and for tumor, cyst, omentum or lipoma at others.

In the twenty-two instances in which nothing was known of the existence of bladder hernia until after the operation was completed it was mistaken for the sac nine times, for a second sac five times, and for a lipoma twice, and six times nothing had been seen at operation which resembled the bladder. Most striking, however, is the large number of fatalities for of the eighty-one cases which he tabulates in which bladder injury was known to have taken place twenty-one died, or a fraction over 25 per cent., and thirteen of them could be laid positively to the bladder injury.

Following along somewhat the same statistical lines as Bruner I have been able to trace 144 cases of bladder hernia, including my own, from the end of 1896 to the end of 1907, of which number eleven reported are indexed but the literature is not available for reference. Of the 133 tabulated, ninety-seven were male and thirty-six female. In the male there were ninety-four inguinal, two femoral and one of both varieties.

In the female there were eleven inguinal, twenty-three femoral and two other varieties. The youngest was a year and a half old and the oldest eighty-two. The largest number, thirty-two, occurred in the fifth decade and there were thirty in the sixth, but the first decade had five. Of those cases 133 in number concerning which complete statistics were found the diagnosis was made before operation eight times and two of them were not operated. At the time of operation diagnosis was made 116 times; not until after operation nine times. In those cases in which the bladder was recognized at the time of operation it was injured in thirty-two, making a total of forty-one cases out of 131 operated cases in which the bladder was injured. Of the thirty-two in which the bladder was recognized and injured four died and the outcome is unknown in three. Of the nine instances in which the bladder was injured, but the injury was not apparent at the time of operation, three were first disclosed at the autopsy. Two others died in spite of the condition becoming known and four recovered. A comparison of these figures with those of Bruner eleven years earlier reveals several interesting facts.

Bruner was able to collect but 181 cases in the entire literature preceding the end of 1896 while 133 have been reported since that time with the literature available. Eleven case reports are made, the literature being for some reason not at hand, and incidentally I have seen mentioned a number of other cases with such vague statistics as to make them of no use. The reason for this apparent great increase in the number of cases is partly those which usually apply to a little recognized abnormality when attention is drawn to it by one or more forceful papers such as those of Bruner¹ in 1898 and Moynihan² in 1901. Every surgeon is then on the expectant list and Moynihan mentions in this paper von Hacker's experience in which in 455 hernia operations only one bladder hernia had been observed while so soon as the order went forth to examine carefully for this feature in any hernia operation it was found six times in the next 187 Bassini operations. Again, and this has been emphasized by various writers, the present modes of operating especially upon inguinal hernia in which the canal is laid open gives opportunity for observing a beginning protrusion of the bladder wall covered by the median side of the hernial sac, and further, the more complete loosening of the sac up to its neck together with the attempt to ligate as high as possible, undoubtedly in itself many times causes the bladder to present in the wound as an artificially pro-

duced hernia of that viscus. I am the more convinced of this because of the fact that in 131 operated cases the diagnosis was made before the operation in but six instances including my own, and it is hardly conceivable that it should have been overlooked in 125 cases had the condition existed before operation.

In Bruner's series the bladder was injured in 59.5 per cent. of the cases recognized as bladder hernia at the time of operation. In the later series the bladder was injured in but 27.6 per cent. of those cases first recognized at the time of operation showing again that operators were put upon their guard in respect to this complication and were recognizing it before any damage had taken place. This is more completely proven by the fact that out of the total number of cases which he records 12 per cent. were first recognized at autopsy or at least not until after the abdomen was closed while this later series shows only 6.7 per cent. entirely overlooked at the time of operation. Again in Bruner's series out of a total of eighty-one cases in which bladder injury took place twenty-one died, a mortality rate of 25 per cent., not all attributable to the bladder injury. In the later series of forty-one cases of bladder injury nine died, a mortality of 22 per cent.: not a particularly good showing when it is considered that the mortality rate for hernia operation *per se* is practically nil at the present time. It is altogether likely too that many deaths from this source are unreported; in fact, I have personal knowledge of one such and have no doubt that many of the Fellows could narrate instances of which they know but which were never made public.

As to the etiology and pathology of bladder hernia I believe nothing more can be said than Moynihan gave in 1901 excepting to insist upon the probability that a far larger proportion of the paraperitoneal form is artificially produced than has been suspected. The recognition of the bladder hernia and avoidance of injury to its wall is the most important consideration. In the intraperitoneal form no difficulty is apt to arise as no operator purposely opens a viscus contained in the sac. The extra-peritoneal variety is more subject to damage as the bladder may be opened under the mistaken idea that it is the sac. The paraperitoneal form is particularly apt to be caught in the bite of the ligature with disaster following later. It has been stated that the color of the bladder wall and its great thickness should lead one to recognize it but in many of the cases reported the wall was so thin that neither its consistence nor color was sufficient to

put the operator on his guard. Of more use is the appearance at the inner side of the sac or suspected sac of a large amount of fat and the large veins which are almost universally present on the bladder fundus but in a difficult operation these may be entirely overlooked.

For the purpose of absolutely identifying the bladder when opened by accident I would advocate the routine use of methylene blue for a day or so prior to the hernia operation. Thus the urine could not be mistaken for serum nor the thinned out bladder wall for sac. While such a procedure may seem unnecessary, nevertheless, since the common forms of hernia are so readily cured by the simplest of operations and the risks of such operations have been reduced to those purely accidental it seems incumbent upon us to reduce these accidental complications to the vanishing point by any means which may be possible.

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- 1021 PROSPECT AVENUE.

REPORT OF A CASE OF GASTRIC TETANY, OPERATION AND RECOVERY.¹

BY

JOHN YOUNG BROWN, M. D.,

Professor of Operative and Clinical Surgery, St. Louis University; Chief Surgeon,
St. John's Hospital,

AND

WILLIAM ENGELBACH, M. D.,

Assistant Professor of Medicine, St. Louis University; Assistant Chief
in Medicine, St. John's Hospital.

St. Louis, Missouri.

GASTRIC tetany is a grave complication of obstruction of the pylorus characterized by attacks of bilateral tonic muscular contractions beginning in the extremities and extending to the face, body and larynx. In this definition we wish to emphasize the obstruction of the pylorus as the anatomical cause for this particular variety of tetany. We deem this necessary, first, on account of the incorrect definition prevalent in the current literature; second, because this anatomical condition is one which can be relieved by surgical means and, third, because we wish to accentuate this form of treatment which will place the majority of these cases, formerly considered fatal, among the curable diseases. Until recently gastric tetany has been vaguely defined as

tetaniform convulsions associated with dilatation or hypersecretion of the stomach. An analysis of the cases up to this time, as will be shown later, demonstrates beyond a doubt that a mechanical obstruction of the pylorus is the initial and causative lesion. The dilatation of the stomach, which is present in this condition, is as much a sequel of this obstruction as is the tetany itself.

This variety of tetany was first described in 1869 by Kussmaul in his classic publication on "The Treatment of Dilatation of the stomach by a New Method—The Stomach-pump." In this work he describes a case of dilatation of the stomach in which severe attacks of tonic convulsions occurred. These convulsions began in the hands and feet and extended up the extremities to the face and body. The local spasms in the face and arms were reproducible by mechanical stimulus. He discovered that stomach lavage would prevent many of these attacks as well as relieve the accompanying gastric symptoms. The following case, bearing such a remarkable resemblance to this first case reported, testifies to the great value of permanently recording unusual clinical data in the literature.

REPORT OF A CASE.

Mrs. M. C., aged forty-eight, housewife.

History.—Family: father died of paralysis commencing in the fingers (?) Paralysis on the father's side of the family. Past: nervous prostration six years ago. Chronic ear trouble, earache, discharge, etc., intermittently all her life. Backache associated sometimes with polyuria which seemed to relieve the pain. Edema of the ankles when a girl. Personal: mother of four healthy children. One abortion without known cause at the third month. Menopause began three years ago. Scanty periods occur yet every four or six months; last one a week ago. Occasional hot flushes, and has been more nervous during this time. Present: duration a year and a half. The onset was gradual with the formation of gas in the stomach causing belching and occasional vomiting. These gastric symptoms were present only after certain diet (potatoes, beans and like starchy foods) and continued one or two months without causing any other marked discomfort. At the end of that time patient began to have a "heavy feeling" in the upper part of her abdomen.

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The first convulsion occurred about three months after the onset. After eating some food "which did not agree with her" she had a feeling of distress described as "distention and discomfort" in her abdomen. This was followed by a very severe convulsion which began with a "feeling of stiffness, folding and clinching of the hands and a drawing down of the toes"; extending rapidly to the muscles of the extremities and involved the muscles of the body and trunk, but not the larynx. These spasms were very painful and lasted for three or four hours. At the end of this time the patient vomited, the vomitus containing a small amount of blood. During the seizure she had been given a number of hypodermic injections of morphine without relief. After the vomiting the tonic contraction of the muscles gradually relaxed, but the patient was left in a collapsed condition for over a day. Following this, attacks varying in severity recurred a number of times immediately after eating so that the patient soon began to associate these convulsions with errors of diet. This led her physicians to use stomach lavage as the treatment for these attacks.

Since this was adopted, a year ago, the patient has been lavaging her stomach as frequently as eight and ten times a day. Whenever she would have any abdominal distress accompanied by numbness or stiffness of the fingers she would immediately introduce the stomach-tube and lavage her stomach or cause emesis. This has served to modify the severity and prevent a number of the attacks of convulsions. She has, however, had an occasional attack of a very severe nature, the last one continuing for two hours, occurring three weeks previous to the date of this examination. Her diet has consisted of milk, buttermilk and crackers exclusively for one year. The appetite has been good, but she has been afraid to eat anything except the above on account of being fearful of bringing on the attacks. No history of severe abdominal pain, hematemesis, jaundice or symptoms referable to other organs, except that given above. She lost fifty pounds of flesh during the last year.

Examination.—General: development and nutrition poor, absence of adipose tissue. Color: mucous membrane pale; skin subicteric; lips crimson; cheeks flushed; hands and toes slightly cyanosed; pulse 112, medium volume, decreased tension, regular rhythm, symmetrical, which compares well with apex beat; temperature 98.4; respiration 20. Regional: ears, eyes and nose negative. Mouth negative, except slight coating of the tongue.

Face: eyes sunken, bony markings prominent. Neck: thyroid, slight diffuse enlargement. Heart and lungs normal. Abdomen: short and wide; slight relaxation of abdominal muscles. Concave epigastrium with protrusion in the umbilical region. Large peristaltic wave rolling across the abdomen from above downward from right to left in the middle segment. These appear three finger breadths above and three finger breaths below the umbilicus, disappearing beneath the right costal arch. They occur two to a minute. Splashing sound is present over this area and marked gurgling is heard on pressure to the right of the navel. Stomach tympany reaches to the lower border of this area three finger breadths above the umbilicus.

On inflation the greater curvature of the stomach extends to three finger breadths above the symphysis, and the lesser curvature two finger breadths above the umbilicus. Laterally, the stomach extends from the right to the left axillary line. A skiagram of the stomach immediately after taking Reigel's bismuth meal practically confirmed the above findings of inflation of the stomach. No tumefactions were palpable before or after inflation. A squirting murmur is heard at the end of each peristaltic wave by auscultating over the right border of the above area. Liver dullness extends from the seventh rib to the costal arch in the mammary line on percussion. Lower border is sharp, surface smooth, not tender or pulsating. Spleen is not enlarged on palpation or percussion. Kidneys: entire right kidney is palpable and distinctly mobile on palpation; not tender. Left kidney not palpable. No other important findings in the abdomen. Vaginal and rectum examination negative.

Nervous system: all tendon reflexes markedly exaggerated. Conjunctival, corneal and pharyngeal reflexes present. No marked sensory disturbance. Trousseau's phenomena positive. Three or four minutes after constricting the middle of the arm the hand became considerably cynosed. At this time the patient remarked, without knowing the purpose of this examination, that the hand felt as it did when she would commence to have her convulsions. Very soon after this the fingers began to stiffen so that it was impossible to bend them; then the extended thumb began to be abducted into the palm of the hand. The flexors of the forearm began to contract gradually flexing the fingers in an extended position over the abducted thumb in the palm of the hand. The whole hand in this position was then gradually

flexed on the forearm. Accompanying these contractures was a complaint of severe pain and the patient said that that was the position the hand assumed in the beginning of her convulsions, and that this spasm would gradually creep up the arm to the trunk and body. Immediately after the constriction was relieved the patient would grasp her hand and rub the same until the muscles relaxed, which would relieve the pain. Chevostek's and Hoffmann's signs were not typically present, but on tapping the face along the angle of the jaw and over the branches of the seventh nerve, occasional fibular contractions would take place in the upper lip and around the eye. The tests for electrical irritability of the muscles and nerves were not made.

Stomach Analysis, April 10.—Stomach emptied without any previous preparation (no test meal). Patient had taken a cup of milk three hours, an orange three and a half hours and crackers four hours previously. No obstruction to the passage of the tube, contents easily procured. Color, greenish. General character, almost entirely fluid, containing fibers of orange and finely divided food-stuff. Chemical: highly acid. Congo, dimethyl-amidoazobenzol, Gunzberg and Boas tests positive. Kelling and Straus test (lactic acid) negative. Butyric and acetic acid negative. Free HCl, 20. Total acidity 80. Albumin button digested in twenty-four hours. Metts tube .5 mm. digested in twenty-four hours. Boas-Rennin test positive in dilution of 1 to 640. Pathological fermentation, very small amount in twenty-four hours. Benzidine and guaiac test negative. Microscopic: muscle fibers negative. Yeast cells positive in twos. Sarcinæ negative. Starch cells numerous. Fat globules many. Bacteria, many short rod bacilli; few other forms. Leukocytes and erythrocytes negative. Epithelial cells, few squamous.

Stomach Analysis, April 20.—Previous preparation, stomach lavage followed by scraped beef and milk toast fourteen hours previous to test meal. Ewald breakfast removed in one hour. Important findings, free HCl, 46. Total acidity 92. Albumin button digested in twenty-four hours. Metts tube .55 mm. digested in twenty-four hours. Boas-Rennin test positive in dilution of 1 to 640. Pathological fermentation negative. Microscopic: muscle fibers positive. Yeast cells in twos. Sarcinæ negative. Starch cells numerous. Fat negative. Bacteria, many short rod bacilli, gram negative. Leukocytes and erythrocytes negative. The findings of chronic hypersecretion could not be demonstrated as the stomach was empty in the morning after

giving stomach lavage in the evening and allowing nothing by mouth during the night.

Animal experiments. (The stomach contents used for these experiments were not fresh, having been kept for several weeks before it was used for this purpose.) Guinea-pigs and rabbits were fed with the stomach contents without producing convulsions or any other noticeable symptoms. Subcutaneous inoculation in a rabbit with a filtrate of the contents caused death from sepsis without the production of convulsions. Two c.c. of an alcoholic extract given intravenously and subcutaneously produced no perceptible change in the rabbit.

Urine examination. Single specimen. Amount: 130 c.c. Color: dark yellow. Transparency: clear. Reaction: neutral. Specific gravity: 1026. Nucleo-albumin trace. Serum albumin, dextrose, bile, blood, indican and skatol negative. Microscopically, occasional hyaline casts and many squamous epithelial cells few polynuclear leukocytes.

Diagnosis.—Anatomical: benign stenosis of the pylorus, dilation and ptosis of the stomach, floating right kidney, slight parenchymatous goitre. Clinical: gastric tetany.

Operation, May 7, 1907.—Ether anesthesia, median incision. Examination of the stomach revealed a cicatrix encircling about three-fourths of the pylorus, causing almost complete obstruction of that orifice. No adhesions around the pylorus. Stomach greatly dilated. Walls marked hypertrophied. No other abnormal findings in the abdomen. Short loop posterior gastroenterostomy, suture method, performed.

Course since the operation. Patient recovered from the immediate effects of the operation rapidly and, with the exception of a slight stitch abscess, made an uneventful recovery. Her diet was gradually increased to a solid diet which she was able to take without any gastric disturbances after three weeks. She gradually gained weight and since this time, now over a year, has been entirely free from gastric symptoms and has never had a recurrence of spasms or convulsions. An attempt was made to demonstrate Trousseau's phenomena three days after the operation without success, and since this time this sign has not been able to be elicited.

OCCURRENCE.

That gastric tetany is a rare condition will be surmised by referring to the bibliography giving the authenticated cases

obtainable. Gumprecht collected forty cases reported up to 1897. Reigel was able to collect only twenty-seven cases up to 1903, of which sixteen proved fatal. Boas refers to thirty-five cases found up to 1907. The largest number of cases compiled was by Edwards who collected 101 cases combined from Reigel, Albu, Frankel-Hochwart and others.

PATHOLOGY.

The pathological lesions present in this disease have been variable. An analysis of the cases reported up to the present time, however, establishes a common functional result caused by these lesions—that of mechanical obstruction of the outflow of the stomach. The following lesions have been reported as the etiological factor producing this obstruction: 1. Cicatricial stenosis of the pylorus due to a previous gastric ulcer has been found in a majority of the cases (Kussmaul, Gumprecht, Fleiner, Caird, Cunningham and others). 2. Malignant stenosis due to carcinoma (Kuchinan, Jeurgensen, Seivers, Boas, Reigel). 3. Sarcoma of the pylorus (Fleiner). 4. Compression of the duodenum by gall-bladder filled with stone (Blazicek). 5. Compression of the duodenum by pancreatic cyst (Berlitzheimer). 6. Torsion of the stomach (Miller). 7. Foreign body in the stomach (Warbasse). Besides these causes, 8. Entozoa (Reigel) and 9. Chronic diarrhea (Ewald and Jacobson) have been found associated with this form of tetany. Strictly speaking, however, if we are to define gastric tetany accurately, we cannot include the latter two causes. They are intestinal and not gastric lesions, and it would be more proper to term these cases "enteric tetany." With the exception of these latter two, the pathological lesion in every case has been one which has caused mechanical obstruction to the motility of the stomach, and we feel justified in affirming the conclusions recognized by Germain-See and Berlitzheimer, namely, that this mechanical gastric disturbance is the most important etiological factor. This lesion need not be limited to one of the seven above, but might be any other intrinsic or extrinsic process causing chronic obstruction of the pylorus or duodenum. No other important lesions are reported. Loeb has described kidney, and Feranini brain lesions which were apparently the result of toxic influences.

Pathogenesis.—Three theories have been advanced to explain the cause of these convulsions: 1. dessication of the tissues; 2. reflex irritation, and 3. autointoxication. Kussmaul attributed

the convulsions to loss of water and consequent desiccation of the tissues. This theory might be applied to what we have called enteric tetany due to chronic diarrhea. Miller and Reigel describe cases in which the convulsions have been produced by mechanical irritation of the stomach, and Miller supported on this ground the theory of reflex irritation. As these two theories have practically been discarded, we will not consider them further. Many French and German authors have endeavored to establish Bouchard's hypothesis of autointoxication. Toxic substances, peptotoxins (Bouberet and Devic) and diamins (Kulneff) have been isolated from the stomach contents of these cases which, when inoculated into animals, produced more or less typical attacks of tetanic convulsions resulting in the death of the animal in some of the experiments. Alkaloidal bodies have been isolated from the urine (Ewald, Jacobson and Albu) which were afterward not present when the patient had recovered from this condition. These bodies have produced tetanic convulsions in animals in some instances, but not in all the cases or experiments. These experiments, then, while they are suggestive, have not absolutely established a theory of autointoxication. On the contrary, Cassaet and Ferre were able to isolate substances from gastric juice of persons not suffering from tetany, which would produce convulsions when inoculated into the animal. Fleiner and Gottlieb employed the peptotoxin manufactured after the manner of Bouveret and Devic and produced a clonic contraction of the animal, but not the tonic variety of contractions resembling tetany. The experiments of Gumprecht, Haliburton and McKendrick with these extracts of stomach contents and urine were unsatisfactory.

CLINICAL COURSE.

In discussing the clinical course of this condition it is necessary to consider both the developing gastric symptoms and the terminal characteristic attack of convulsion. The abdominal symptoms will depend entirely upon the kind of lesion producing the obstruction of the pylorus. We cannot go into detail regarding the symptoms of these numerous lesions as each has its own peculiar clinical picture. No matter what the lesion may be, however, the clinical course and findings of a high grade of motor insufficiency of the stomach is usually presented. These symptoms and signs combined with the characteristic convulsions of tetany, the same as due to any other cause, produce a fairly

classical and simple picture of this very serious disease. In the majority of cases the attacks of convulsions were usually preceded by prodromal symptoms in the abdomen referable to the stomach, such as fullness, distention, nausea, gastralgia and the like. The onset of the convulsion is usually sudden, beginning with sensory disturbances in the hands and feet, which are soon followed by spasms of the distal flexor muscles, extending rapidly to the muscles of the extremities and body. The slightest convulsive phenomena are those of creeping, numbness, formication and slight tonic contractions, particularly located in the hands and face. These slight symptoms may be present for a long time without developing into the classical convulsion or they may immediately precede a typical attack of a generalized convulsion. For this reason such symptoms associated with gastric disturbances should always lead to a careful examination of both the stomach and the nervous system. Ury describes attacks of tetaniform convulsions in the extremities without the presence of a generalized convulsion, which were associated, however, with more or less disturbance of consciousness. Cases have been described in which the clinical picture varied between tetany, tetanus and epilepsy. In some of the cases of a favorable course temporary disturbances of the intellect, loss of memory, disturbance of vision and speech were present. Unconsciousness for a varying length of time occurred in some of the graver cases reported.

Trousseau classifies three different degrees of tetany according to the extension of the convulsion: 1. a mild type, in which all the muscles of the extremities are seized; 2. a medium type, in which, besides the above, muscles of the trunk, body, abdomen and face are involved, and 3. a grave type, including the muscles of the larynx, pharynx and tongue. The pathognomonic sign of tetany convulsions, which differentiates them from convulsions due to other causes, is the fact that some of them can be reproduced by mechanical or electrical stimulus during the interval between the attacks. Symptoms referable to other organs are those due to inanition and those produced by the special lesions causing obstruction of the pylorus. Imbert-Gourbevre, Belpech and Rabaud observed that albumin urea was present in fatal cases.

DIAGNOSIS.

The positive diagnosis depends upon demonstrating, first,

the finding of an obstruction of the pylorus and, second, characteristic muscular contractures, some of which are reproduceable by mechanical or electrical irritability and excitability. The diagnosis of obstruction to the pylorus in these cases is usually easy, because the stenosis has reached a high degree before the convulsions occur. In the majority of the cases food remains, which had been taken from twelve to fourteen hours previously, were found in the stomach or vomitus. The kind of stenosis must be determined from other clinical data, which space forbids us to consider at this time. Diseases which might be confused with this condition on account of similar gastrointestinal symptoms are especially the gastrointestinal neurosis associated with abdominal ptosis. These do not present the clinical picture of second-degree motor insufficiency of the stomach, nor do they have the severe muscular reproduceable spasms which is characteristic of tetany.

The demonstration of the characteristic convulsions of tetany, which are the same in this variety as those due to any other cause, is made by eliciting the following pathognomonic signs. These signs are present during the intervals between the attacks of convulsions:

1. Trousseau's phenomenon or the mechanical irritability of the nerves. This sign is produced by constricting the arm, which causes the typical contracture in the hand and forearm. Whether these contractures are due to pressure upon the nerve or the blood-vessel is yet an open question. In our case we believe it is due to compression of the vein, because the contractures in the hand did not occur for three or four minutes after continuous pressure had been made over the nerve. The contractures did occur constantly about one minute after the hand had become markedly cyanosed.

2. Chovestek's and Hoffmann's phenomenon or mechanical superirritability of the facial nerve. This sign is elicited by tapping the branches of the facial nerve which produces a contraction of the muscles supplied by the individual branch of the nerve thus irritated.

3. Erb's phenomenon, or increased galvanic and faradic irritability of all the motor nerves except the facial. According to Frankel-Hochwart, this phenomenon cannot be entirely accepted. He maintains that there is an increased galvanic irritability present in all the cases, but that the faradic irritability is normal in the majority and only increased in a few.

Other diseases which must be differentiated from gastric tetany on account of having convulsions similar to this affection are hysteria, epilepsy, occupation neurosis, acroparesthesia, meningitis, brain tumor, rickets, thyroid and parathyroid affections, acute infections, nephritis, intoxications (ergot, morphine and lead), eclampsia and tetany occurring during the puerperium and lactation. Thirty-two cases of tetany occurring during the puerperium and fifteen cases of tetany due to syphilis (Howard) have been reported. All of the above conditions are easily differentiated from gastric tetany by: 1. the absence of positive signs of pyloric obstruction; 2. the absence of three cardinal pathognomonic signs of tetany, and 3. by the clinical symptoms peculiar to the individual disease under consideration.

PROGNOSIS.

The prognosis of gastric tetany has always been considered very grave. The mortality under medical treatment up to the present time has been 88 per cent. The cases reported by Kussmaul, which were treated in this way, resulted fatally. Slotau Fenwick reported a case in which death took place after sixteen hours of tetany during the first seizure. Bouveret and Devic gave the mortality as 70 per cent., and Meumann's estimation of the mortality in his report was 72 per cent. Until the surgical treatment was introduced nearly all the cases died in one of the attacks. Since this treatment has prevailed the mortality has been reduced to 37.5 per cent. The prognosis of the individual case depends necessarily upon the nature of the lesion producing the obstruction of the pylorus. If this is a malignant obstruction, as has been the case in about 10 per cent. of the cases reported, the prognosis is necessarily very unfavorable even under surgical treatment. As the majority of these cases are due to lesions which can be relieved by surgical intervention, the present mortality should be greatly reduced, providing the condition is recognized before other counterindications for operation arise.

TREATMENT.

Prophylactic treatment of this condition is very important. It deals with properly caring for these lesions before they cause serious obstruction to the pylorus. This is another argument for a radical surgical treatment of chronic ulcers, cholelithiasis, etc. The nature of the pathological lesions precludes a curative

medical treatment. Symptomatic treatment, however, during the attacks must be given expeditiously. This consists of stomach lavage, hypodermoclysis, proctoclysis and morphine hypodermically. Radical surgical treatment, depending upon the lesion present, is the only rational treatment that should be considered. This was first advocated by Mayo Robson, who has reported three cases cured by this means. Fleiner (two cases), Gumprecht and Caird have reported cases due to cicatricial stenosis of the pylorus which have been cured by operation. Cunningham has collected eight cases and Warbasse has collected six cases which were also cured by this method. Jennosco collected eleven cases which had been operated upon with eight recoveries. The operation of election depends necessarily upon the conditions present in the individual case. In the majority of the cases operated upon successfully pyloroplasty or gastroenterostomy was performed.

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TREATMENT OF TYPHOID FEVER PERFORATION.¹

BY

J. D. S. DAVIS, M. D., L. L. D.,
Birmingham, Ala.

Professor of Surgery, Birmingham Medical College.

I HAVE operated on ten cases of typhoid fever in which perforation had been suspected. In nine cases perforations were found. Death occurred in two cases. In one case no perforation was found. The first death occurred on the operating-table. The second death occurred on the ninth day as the result of pneumonia complicated with secondary perforations and gangrene of intestine.

In the prognosis of typhoid perforation, the individual physical condition, power of resistance, character and virulence of the organism in the peritoneal cavity, age of the patient, time elapsing between perforation and the performance of the operation are important factors in determining the result. Perforation occurs in cases of all grades of severity, from the ambulatory to the hemorrhagic type. It is most common in those with severe infection. It is more common in the hemorrhagic than in the mild cases. It occurs in the so-called ambulatory cases of typhoid. The ileum is the common site of perforations; the majority occur within twelve inches of the ileocecal valve; the appendix and colon, respectively, are the next most frequent sites of perforation.

Bacteriological examination of the peritoneal fluid is an aid

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to prognosis, the streptococcus infection being more fatal than the typhoid or colon bacillus. The prognosis is more favorable in the young than the old—two to one according to Elsberg. Time is the most important element in the prognosis—the earlier the operation after the perforation the more favorable the result. Like gunshot wounds, the prognosis depends largely upon the time the operation is done. Perforation occurs in one-third of all deaths from typhoid fever—some authors place the per cent. over one-third.

The study of typhoid perforations is one of importance to which it is impossible to devote too much attention. It is a momentous subject, and it is incumbent upon us not only to make ourselves intimately acquainted with its etiology and pathology, but with the diagnostic features which differentiate it from affections presenting a somewhat similar appearance. This is not always easy, but often the matter is simple enough to guide the physician to seek surgical aid.

Typhoid fever is to a very large extent a surgical disease, and if possible every case should be carried to a hospital, where prompt surgical aid may be had should it become necessary. The treatment of typhoid fever is, in fact, like guiding a runaway horse: keep out of the ditches and off the stumps and ninety per cent. or more of the cases will recover. Of the remaining small per cent., if turned over to a competent surgeon, he will save at least thirty-five, if not fifty per cent. of the perforating class.

Blake says, "The physician who makes a correct diagnosis of perforation and calls in the surgeon should receive equal measure of credit even if the operation is successful." His results show that at least one-fourth of the patients suffering from intestinal perforation can be saved by operation. Nearly all of the patients with perforation who are not operated on die, so surgical treatment of perforation is productive of good results. The percentage of recoveries would be even greater if a diagnosis of perforation could be made earlier after its occurrence. The most common time of perforation is between the fourteenth and the twenty-fifth days. In about ninety-two per cent. the perforation occurs between the second and the fifth week, inclusive. The earlier cases are probably perforation in a relapse; now and then perforation may occur without evidence of previous illness. Pain of some kind is present in seventy-five per cent. of all cases. In about fifty per cent. of the cases the onset is sudden and

severe and of increasing intensity, localizing itself in a special zone. In about twenty per cent. of the cases the pain is of slow onset, with general distribution. In some cases no pain is complained of, and the usual symptoms of perforation are absent. Tenderness and rigidity are present in sixty-five and seventy-five per cent., respectively, of all cases; in some cases either one or the other may be wanting, rigidity especially may be absent in cases with rather a pendulous and relaxed abdominal wall.

There is a very wide variance in the reported statistics upon perforation in typhoid fever. Osler found about five per cent.; Fitz, six and one-half per cent.; Murchison, eleven and one-third per cent.; Cushing, in thirty autopsies at Fort McPherson, found twenty per cent. Reports from several large hospitals variously give the per cent. from one to five.

There is no definite relation between perforation and the severity of the attack. It occurs in all classes of cases. There is a great variance in the size and shape of the perforation: they are found as small as a pencil point and large enough to take in half the circumference of the bowel. The large perforation may take any shape from oval to rectangular, owing to the character and extent of the necrotic process. Sometimes a perforation of the serosa is found without complete destruction of the other coats of the bowel. Perforation is generally found at the base of a small punched-out abscess.

Impending perforation due to the sloughing patches in the mucous and submucous tissues may be recognized by the grayish button-like nodules beneath the peritoneum. Often the impending perforation is protected by exudative adhesions that may circumscribe the extravasation, as is often noticed in the appendicular perforation. Sometimes, owing to the thinning process due to mucous and submucous slough at the site of Peyer's patches, the general cavity is infected and a general diffused peritonitis results when no perforation is found. The character and extent of the peritoneal involvement will depend largely upon the character of the infection. The more virulent, the sooner will the patient die, and often with very little evidence of peritoneal involvement.

Moynihan says perforation is generally found to have occurred in the last twelve inches of the ileum. In three hundred and sixty-two cases (Harte and Ashhurst) seventy-three per cent. of the perforations were found within twelve inches of the

cecum. About 2.1 per cent. were found at a distance of three feet or more. In seven cases the colon was perforated, five in ascending, one in transverse and one in the sigmoid flexure. Meckel's diverticulum was perforated three times and the appendix eight times. The perforation is generally single; sometimes more than one perforation and, in rare cases, numerous perforations are found.

The chief points of diagnostic importance are the increase of pain and muscular rigidity. Pain is much less reliable than rigidity. In fact, a sudden tightening of the rectus on side of the lesion is about as reliable a sign of perforation as crepitation is of fracture. Mikulicz (who was the first to operate for gastric-ulcer perforation) first operated for typhoid perforation, April 7, 1884, with success.

In many cases the patient is desperately ill and prompt recognition of the trouble and early operation is necessary. In many cases it is a race with death, and there are often anxious moments when it is questionable which will win. The chief difficulty in these cases is the question of diagnosis, and when in doubt an exploratory operation is advisable.

In arriving at the diagnosis, no one pathognomonic symptom is always present. Rigidity is more often found than any other symptom. Next to rigidity tenderness is of greater assistance in making a diagnosis than any other one symptom. The pain in typhoid-fever ulceration is slow and continuous and does not always increase in severity prior to perforation, and often even subsides after perforation. It does often increase after the perforation, and is not often well localized.

With appendicitis the same character of pain may exist, but it frequently begins suddenly—often it is the first sign of illness (for first twelve or twenty-four hours pronounced in the epigastric and umbilical regions)—and then becomes localized over the appendix. Exceptions, of course, exist. Sometimes appendicitis is manifested by a general headache and boneache, with absence or with more or less fleeting abdominal pains, while with typhoid fever severe pain may be manifest.

Temperature is not a reliable guide, though a sudden drop may indicate abdominal complication. The pulse is not to be relied on in making a diagnosis. It may become weak and frequent, but not to a perceptible degree, except when shock is found. It usually remains stationary, except in shock, and after shock it returns to its previous state. Inhibited peristalsis may produce

marked tympany; therefore, tympany has no special significance in perforation. The fluid effusion, however rapidly it may form, may not be recognized. It does not always so shift as to change the dullness from flank to flank according to position.

The effacement of hepatic dullness is given as one of the stereotyped signs of perforation, but it is equally as manifest both in intestinal paresis or atony as in perforation, and it is often difficult to say from which it occurs.

Blood examination is important in making a diagnosis of typhoid fever, but of little value in diagnosis of perforation. Marked leukocytosis is seldom present. Because of individual variations in resistive and reactive functions absolute count of leukocytes, if taken alone, has but little value as a means of diagnosis, and no absolutely invariable single total amounts, or cell percentage, can be laid down as significant of definite conditions.

Scott and other authors say abdominal rigidity indicates peritonitis in the neighborhood of the anterior abdominal wall. Scott says rigidity is rarely present in typhoid except in children, and if one never operates on a flaccid abdomen he will never operate in the initial stage of typhoid perforation. I think muscular rigidity is more general than he thinks—oftener than seldom present in adults as well as in children. When the history points to acute appendicitis or intestinal perforation with a flaccid abdomen, either the history is misleading or the appendix or perforation is located where an attendant peritonitis cannot affect the abdominal muscles, namely, in the pelvis or high up under the liver. Abdominal tenderness does not always exist in the adult, but when it is present and its significance can be properly interpreted it is a valuable localizing aid.

If about the tenth or fifteenth day severe pain is experienced with tenderness near McBurney's point, the indications point to appendiceal involvement, and an exploration is necessary. If the abdomen be opened before perforation takes place, the ulcerating appendix should be removed and the surgeon congratulated for removing the appendix before perforation; for an appendix so involved as to give rise to a local peritonitis will soon perforate. There is more or less effort on the part of nature to protect the impending perforation by surrounding and covering the site with exudation adhesions, which is much less successful in the movable ileum than in the more stationary part of the bowel—colon, cecum and appendix.

In one of my cases no perforation was found, but the appendix was very much inflamed and bound down by adhesive exudate, but not in such a way as to have limited the infection of the threatened perforation. On the lower border of the first inch of the ileum a large discoloration with thinning of the wall was found. I removed the appendix and drew the cecum up in such manner as to cover the ulcerating area in the ileum and stitched it over the ulcer, so that in case perforation should take place it would be protected. Where this is possible, it is, I think, safer than a covering of omentum. This experience, with like observation on dogs, has led me to believe that wherever practicable the large bowel should be used to cover weak places, impending perforations and faulty bowel closure. The sigmoid, if so utilized, is a valuable aid to the pelvic surgeon.

The case of colon perforation was circumscribed and occurred in a patient from whom my brother, Dr. W. E. B. Davis, had removed the appendix four years previously. The perforations in ileum cases were not circumscribed, but the purulent effusion was diffused considerably, yet was not general in two cases, general only in one case; one was perforated at the base of the appendix, the perforation involving the cecum, and was localized, but not circumscribed completely by adhesions; the fourth appendix case was not perforated, but it was very much inflamed, swollen and bound down by plastic exudate. This was the case in which there was a large discolored and thinned area on the first inch of the ileum that would have ulcerated very soon—possibly did perforate against or into the protecting cecum that I had sutured over the ulcer area.

In one of my cases of perforation in typhoid, in which I found the infection circumscribed, there was an opening into the cecum at the appendiceal base large enough to admit the index-finger. The appendix was not found and the abscess sac was drained. Many months later I operated on this patient to relieve the resulting fistula. On opening the abdomen I found a general miliary tuberculosis—the entire abdominal viscera being involved. In making dissection from above I found the transverse colon attached to the ascending colon with an anastomotic opening. When I discovered there was communication I did not think it practicable or safe to leave the ascending and transverse colon united, for fear the intestines might pass under the cleavage and give trouble. So, instead of leaving the union intact, I severed it and closed both openings in the colon in the following manner:

the serosa, which was studded with miliary tubercles, was turned back and the musculature was turned in and approximated by interrupted sutures; then the serosa was brought together with continuous sutures, closing the abdominal wall with tier sutures without drainage. I confess I felt very uneasy and skeptical about the sequel with the entire serosa studded with miliary tubercles, but the result of the colon closure was good. The patient is well and in college.

One case had two perforations in the ileum. The patient had been sick for ten days, and gave a history of perforation of probably two days' standing. The case was Jack ———, fifteen years of age; had a pulse rate of 140 per minute; respiration, 40 per minute, and had persistent fecal vomiting. I operated as soon as possible, and found two perforations in the ileum. One was about the size of a pencil, eleven inches from the ileo-cecal valve, and the second perforation, fourteen inches from the ileo-cecal valve, was the size of a pencil point, just large enough to allow gas to pass.

By reason of profound exhaustion this patient was lost on the table. I closed the intestinal perforations and completed the peritoneal toilet, but before the abdominal incision could be closed the patient died as if his heart had been chopped open with a hatchet. I opened the chest after the method of my brother, Dr. W. E. B. Davis, and massaged the heart, but was unable to get a single response.

On May 18, G. K., age fourteen years, was brought to my infirmary on the tenth day of fever with the history of increased pain in the umbilical region; with increased tenderness and with rigidity on the right side. Widal was positive—low blood count. I made incision through the outer border of the right rectus fascia, found two perforations, one four inches from the ileo-cecal valve and the second at the base of the appendix. Appendix was found imbedded in exudative adhesions surrounded by pus, but was with some difficulty removed. Pus was mopped out, both openings closed and wick drainage placed in lower part of incision. Recovery was prompt as in an ordinary circumscribed appendicial abscess.

The last case, a fatal one, Angel Stephen (Hungarian), age thirty-five, was brought to the Hillman Hospital, October 9, with typhoid fever. Symptoms of perforations occurred the morning of October 17. His blood count had been low. At this time the leukocytes were seven thousand, polyneuclears six

hundred; right rectus became rigid, with pain and tenderness in the right iliac region. The incision was made in the outer border of the right rectus fascia. A small perforation was found in the ileum near the ileo-cecal valve. The appendix was very much inflamed and just ready to perforate; the perforation in the ileum was closed and the appendix removed; the abdomen was drained and treated by the Murphy method. The patient did well until the twenty-second, when he developed pneumonia; on the twenty-fourth of October he became very much exhausted, temperature and pulse were both very high, and in a few hours he became unconscious. Blood pressure was one hundred and ten. He had a Hungarian friend who was willing to act as donor, and I transfused him with blood until his blood pressure was raised to one hundred and forty, at which time he became conscious and expressed himself as feeling better. The patient did well for twenty-four hours. He died on the twenty-sixth, nine days after operation, with pneumonia complicated with secondary perforations and gangrene of the intestines.

All of these cases were drained, except the case in which no perforation occurred and the case of miliary tubercles at the second operation. Incision in the outer border of the right rectus fascia was made in each case. Pus was mopped out in one case, and drained through stab wound; in the other cases, except the last two, which were treated by the Murphy method—the purulent fluid was mopped out as well as possible and then irrigated by means of pitchers full of hot saline solution poured into the abdomen.

Each case should be treated on its own merits as to the anesthetic—local, general or none at all—and as to the location and character of the incision in the abdomen. A few cases are so ill that they should be operated upon without an anesthetic; but where a general anesthetic cannot be borne, a local anesthetic may be used. Where and when necessary to do more than a drainage operation, a general anesthetic is best. An incision through the right rectus fascia will in most cases afford ready access to the bowel involved, which may be extended up or down as the indications may require. If the exudate is general, that is diffused or spread all over the abdomen, or peritonitis is general, the incision should be made in or very close to the median line and should extend from the pubis to or above the umbilicus.

My experience in many cases of diffuse peritonitis, particularly in experimental investigation on dogs, has convinced me that the longer the incision, the better can all affected parts of the peritoneum be inspected and cleansed. Through a long incision one can better get at and close all perforations and get out. Allow the pus to flow out, and, when necessary, gently dip it out with sterile gauze sponges or swabs, and discard the sponges as fast as used. Add as little trauma as possible to the peritoneum: it will not stand for it. I will here emphasize, with borrowed expressions about septic peritonitis, as applicable in a large class of perforations of all kinds, especially in typhoid, that we should operate early, incise amply, repair carefully, manipulate gently, wash thoroughly perform rapidly, if possible close completely—if not, drain, thoroughly—and then narcotize deeply.

When the abdomen, with great gentleness, has been emptied of the septic fluid, first expose the cecum and appendix; next inspect the cecal end and then inspect the ascending and transverse colon; it is rarely necessary to inspect the jejunum, duodenum or stomach. Remove the appendix, if involved; close or repair the perforated bowel (if possible); then drain with gauze wick and rubber tube. While I think the Murphy method applicable to a large number of cases, in all of these except the last two and appendix case, I flushed the abdominal cavity with large quantities of hot saline solution poured from pitchers. I begin usually in the region of the cecum, and have the right side of the abdominal wall well drawn to the side, the intestines and omentum are lifted with the gloved hand, and the flushing continued until the cecal region is cleansed of all débris; then in like manner the gloved hand is carried down into the right pelvis; then to the left side of the pelvis; then up to the region of the sigmoid and splenic flexure and finally clear around the cavity, lifting and mobilizing the intestines in a way to make room for the hot flushing saline, without disturbing adhesions and adhesive exudate more than necessary. By mere inspection and by means of an irrigating tube it is not probable—hardly possible—to reach collections hid behind adherent intestine, but with one or both gloved hands the intestines may be lifted and mobilized with great gentleness.

In the experimental investigations upon dogs made by my brother and myself many years ago, we found that if the entire peritoneum showed gross changes (general suppurative peri-

tonitis), its recuperative powers were not sufficient to prevent death; when one-fourth of the peritoneal cavity was not involved recovery was possible and did sometimes take place; when one-third of the cavity was exempt, recovery was probable, and when only one-half became involved, recovery was very certain. In a few cases I believe it is good surgery to close the abdomen after a thorough toilet of the peritoneum, especially when the perforation can be satisfactorily closed and a satisfactory toilet made. In cases that cannot be closed, and they constitute a large number, drainage wicks should be placed, either through the original incision or a stab, and stitched to either side of perforation with catgut.

The class of cases in which the infection becomes localized (walled off by exudative adhesions, whatever the size) should be drained. If the infection is mild the drainage will turn the scale in favor of the patient.

The distinction between diffuse suppurative peritonitis and large abscesses is so apparent that it would not necessitate an explanation, but for the fact that some excellent writers make no distinction and classify all purulent exudates as cases of free purulent peritonitis. Many cases of suppurative peritonitis have been reported which, if the truth could be known, were cases of large quantities of pus in the cavity, but have been circumscribed until near the time of operation. I have operated on many such. The question of shock following perforation in typhoid fever has received considerable discussion. As in gunshot injuries of the intestines, one can never know that the shock and extreme prostration may not be due to hemorrhage, and to wait for shock to subside is to wait for death. I believe in the earliest possible operation, even in the presence of profound shock.

The Murphy treatment of peritonitis is not applicable to all cases of typhoid perforation. Simple drainage, without mopping out pus and irrigating, is applicable to a large number of cases of peritonitis, but in typhoid perforation, where there is a large exudate of intestinal contents, general thorough flushing seems indicated. With the Murphy method, the abdomen should be opened over the seat of primary focus of infection, perforation closed and any other trouble corrected. A second short incision should be made above the pubis for the insertion of a large rubber drain down to the bottom of the pelvis. No effort should be made to remove pus by mop or flushing. The patient

is placed in bed in exaggerated Fowler's position and secured by elevating the bed about fifty degrees and supporting the hips with a wood seat rest like that of Dr. Stewart McGuire. Physiological salt solution subdermically should be used when needed for failing heart, and proctoclysis continuously until sepsis is overcome. Transfusion of normal salt solution (in large quantities) or blood (Crile's method) should be resorted to in great prostration and exhaustion from hemorrhage. Morphine should be given for rest, sparteine, in large doses, for general stimulant and prophylactic against suppression of urine. Strychnine and digitalis are rarely given. Purgation should not be employed. Stomach lavage for nausea and vomiting should be repeated at necessary intervals, and all food withheld until patient recovers sufficiently to retain and assimilate it.

The abdominal wall should be closed with through-and-through wormgut sutures in the cases drained through the incision. When a thorough peritoneal toilet is possible, suture of each layer separately with kangaroo or catgut suture is preferable.

To sum up the main points:

1. Typhoid fever is a surgical disease.
2. About five per cent. of typhoid fever cases perforate.
3. Nearly all perforating cases die if left to nature's resources.
4. A large per cent. may be saved by prompt operative interference.
5. Incision should be large enough for expeditious work, preferably through right rectus fascia.
6. Lavage with hot saline is essential in a large number of cases, especially when fecal extravasation has taken place.
7. If a perfect peritoneal toilet can be secured, abdominal closure may be made without drainage.
8. Treatment by posture (Fowler's position) to confine bacteria and septic material to lower abdomen is important.
9. Treatment should be directed to destroy or impede growth of bacteria already in the tissues and blood—antistreptococcus serum and unguentum Credé.
10. Elimination should be secured by physiological salt solution hypodermically when indicated for failing heart, and proctoclysis continually until sepsis is overcome.
11. Supportive treatment should consist in transfusion of salt

solution or blood; strychnine and digitalis for heart stimulant; sparteine, in large doses, for general stimulant and prophylactic against suppression of urine; morphine should be given to control peristalsis and produce rest, control shock; and nourishment should be given as early as possible.

2031 AVENUE G.

CANCER OF THE CERVIX UTERI IN PREGNANCY.

BY

I. S. STONE, M. D.,

Washington, D. C.

(With plate.)

THIS comparatively rare complication has afforded an opportunity for much speculation upon the part of writers on obstetrical subjects and largely because two lives are to be considered. It may be taken for granted that conception is not probable in any case of delayed cervical cancer. Therefore, the majority of cases like ours are found in the later months of pregnancy when the attention of the physician is called to more or less hemorrhage which usually alarms the patient; her attitude in respect being unlike that of patients with hemorrhage about the time of the menopause. It may be considered the accepted professional opinion that carcinoma develops rapidly during pregnancy, and if discovered early, as during the first four months, should be treated by emptying the uterus and a possible vaginal hysterectomy as a matter of choice. But, on the other hand, it may be declared the opinion of many that in the discovery of uterine cancer in its early stages after the sixth month, there may be some time given for the development of the child until viable. This is a moot point, and one upon which there is much debate, and the wishes of the mother (the parents) may have some influence upon the choice of procedure. In certain rare instances there may be such a strong desire for a living child as to prompt the mother to take a great risk, or else she may be considered beyond the reach of our art and yet may desire to preserve the life of her offspring, whatever the risk. For the various opinions held, the writer has profound respect, for he cannot doubt the sincerity of those who advise procrastination, yet he firmly believes that, as a rule, every cancerous uterus should be removed promptly, whether pregnant or not, unless

the disease has extended so far as to render such an operation absolutely unsafe.

According to Sarwey (quoted by Williams, p. 468), one cancer is found in about 2000 pregnant uteri. Hence we make no apology for reporting our only observation in which operation was performed. Our experience is not, however, entirely limited to this one case, for we have seen two abortions occur in women who later on had cancer. It is well known that cancer causes abortion and we would unhesitatingly publish these cases as due to cancer but for the fact that they may have been due to chorioepithelioma.

Treatment.—As cancer frequently produces abortion, and may induce placenta previa, or else may endanger the life of the mother by rupture of the uterus during labor, we advise Cæsarean section if the child is viable. If the child is dead, or in any event after emptying the uterus, the uterus should be promptly removed. It would scarcely seem possible to secure as good results through natural delivery as may be obtained by surgical delivery by the abdominal route, or complete hysterectomy, as in our case now to be reported.

Mrs. T., colored, was admitted into Columbia Hospital on June 3, 1907, with the following history: She was thirty-three years of age, and had been pregnant six months. She had given birth to nine children, the youngest being about eighteen months old. Previous to the present gestation, she had moderate menorrhagia, but she had entire suppression of her menses for two months after impregnation before a bloody discharge appeared, which persisted irregularly until she came up for treatment and operation. She presented none of the signs of wasting disease or cachexia and claimed that she had not lost much in weight. She was at least six months pregnant and her child was alive and making vigorous movements within her uterus. Examination of the body of the woman, including the exterior of the abdomen, revealed nothing to show any abnormal condition. We found the cervix large; hard on the outer or vaginal aspect, and soft about the external os and within the cervical canal. It was easy to establish a diagnosis of cancer, and this was confirmed by examination with the speculum and by the microscopic.

Operation.—The uterus was removed entire, along with the adnexa and as much of the parametrium as was easily reached. The uterus was not opened for the delivery of the child until after the specimen was handed to an assistant. Careful search was

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STONE-CANCER OF THE PREGNANT UTERUS



made for enlarged glands. The entire space between the broad ligaments and along the vessels and ureters being opened up and examined without the discovery of a single gland or any evidence of metastasis. The child lived two hours after the uterus had been removed. The drawing shows the placenta in position.

Pathological Report.—The cancer, a squamous-celled epithelioma, is apparently confined to the cervix. The connective tissue, however, contains evidence of extension on the right of the uterus. There is a polypoid mass near the external os.

The patient reported herself well twelve months after operation.

STONELEIGH COURT.

THE ANATOMICAL BASIS FOR SUCCESSFUL REPAIR OF THE FEMALE PELVIC OUTLET.*

BY

IRVING S. HAYNES, Ph. B., M.D.,

Professor of Practical Anatomy, Cornell University, New York City; Visiting Surgeon to the Harlem Hospital; Member of the New York Academy of Medicine, the New York Surgical Society, the Society of the Alumni of Bellevue Hospital, the American Medical Association.

(With Illustrations.)

THE female pelvic outlet is subject to severe traumatism at every parturition.

Such traumatism may produce no more lasting effect than a ruptured fourchette or it may result in a tear so extensive as to sever all the tissues between the vagina and the rectum.

For years surgeons have been operating upon these lesions with varying success.

Any plastic operation to be successful must have a solid anatomical basis. Note, for instance, the great variety of operations proposed and practised upon the inguinal region for hernia and their indifferent success or complete failure until the procedure of Bassini was given publicity when a great gain in cures followed. Why? Because Bassini's operation has a solid anatomical basis for its execution.

It seems to me that the one *fundamental idea*, the only *rational aim* for the surgeon in all such plastic work is to *restore the damaged parts to their normal state*; in other words, to follow

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Nature's plan in the reformation of the region under his consideration.

My purpose here is to demonstrate by actual specimens the structures which close the pelvic outlet in the female, to explain their action, to show what may occur if these structures are ruptured and to point out what seems to me, at least, the rational method for restoring these parts to a normal condition after such rupture.

I wish to state at the outset that I bring you nothing original. The anatomy of the part is the same as it has doubtless been for ages. The location and extent of the various lesions have been fully described by preceding writers. But the significance of such lesions is not universally recognized and their treatment varies almost with each individual operator.

In fact, the treatment of pelvic lacerations is in sufficient chaos to justify a reasonably careful review of the salient features of the subject.

I. THE ANATOMY OF THE FEMALE PELVIC OUTLET.

In this consideration I aim to point out only those facts which are pertinent to the practical aspect of the subject.

The Pelvis.—The ossa innominata and the sacrum (with the coccyx) form the bony frame-work of the pelvic outlet.

It is an irregular-shaped segment of a cone, to the upper border of which is attached the spine and the abdominal walls; to its lower and outer surface, the lower extremities, and about its inside, the structures which close the pelvic outlet.

The Pelvic Muscles and Fasciæ.—The inner surface of the pelvis is padded by the obturator internus and the pyriformis muscles. Over these muscles is spread the pelvic fascia, which forms a funnel-shaped membrane attached to bone and ligament about the margin of the muscles. Above, to the promontory of the sacrum, the iliopectineal line and the inner surface of the pubis. Below, to the ischiopubic rami, the tuberosity of the ischium and the great sacrosciatic ligament. The pelvic fascia is crossed from the inner surface of the pubis to the spine of the ischium by the "white line," which serves to mark the separation between the pelvic cavity above and the ischio-rectal fossa below. The pelvic fascia above this line is the *parietal pelvic fascia* and that below is the *visceral pelvic fascia*. The latter drops downward and inward to the bladder, vagina

and rectum, forming for these viscera their true ligaments. The portion of the fascia over the obturator muscle is also called the obturator fascia, and that covering the piriformis muscle, the piriformis fascia.

The above statements agree with those given in the text-books of anatomy. Close dissection shows, however, that they should be modified in some particulars, for the following arrangement prevails in many of the female pelvises.

If the anal fascia has been removed and the lower surface of



FIG. 1.—The outlet of a female pelvis.

the levator ani exposed, by gently using the fingers or the handle of a scalpel, it will be found that the levator ani and the parietal pelvic fascia are easily separated as one layer from a more external layer of fascia, which is the "true" obturator fascia. This layer covers the obturator muscle and is attached to bone and ligament all about its margin, viz., along the ilio-pectineal line, to the upper margin of the obturator groove and to the inner surface of the pubis; below, to the spine of the ischium, to the great sacrosciatic ligament, tuberosity of the ischium and the ischiopubic ramus.

The inner layer is the parietal pelvic fascia, which for its upper

attachment follows the same lines as the true obturator fascia does, but, after the limits of the obturator muscle are passed, extends over the piriformis muscle as the piriformis fascia, and is in this



FIG. 2.—The left half of a female pelvis to show the line of attachment of the pelvic fascia, triangular ligament and the points between which the "white line" extends.

region attached to the posterior portion of the iliopectineal line, the front of the sacrum, the great sacrosclatic ligament and the



HAYNES. FIG. 3.—A side view of the right half of a female pelvis, placed in the normal position with reference to the horizontal plane. A. The line of attachment of the parietal pelvic fascia. The segment from A. to B. also indicates the attachment of the true obturator fascia; B. the inner surface of the pubes, the beginning of the "white line," the origin of the pubo-coccygeal (pubo-rectal) portion of the levator ani muscle; C. the spine of the ischium and the posterior point of attachment of the "white line;" D. is placed between the attachments of the two layers of the triangular ligament (perineal shelf). It also indicates the lower line of attachment of the true obturator fascia. The angles that the various "lines" make with the horizon are indicated. Note that the perineal shelf is practically horizontal.

spine of the ischium. This fascial plane drops downward and is called the parietal pelvic fascia until a point is reached where it is thickened by the addition of some fibers running anteroposteriorly from the inner surface of the pubis to the spine of the ischium, the so called "white line"; below this line the fascia is called the visceral pelvic fascia, and it is disposed as previously given. There is thus formed a *continuous* plane or layer of fascia, the upper part of which is usually described as the parietal pelvic



FIG. 4.—Dissection of the female pelvic outlet. Note the prominent pubo-coccygeal hammock formed by the sphincter ani externus and the sphincter vaginae. Laterally is seen the levator ani muscle. Anteriorly is the perineal shelf, with the fibers of the transversus perinei muscle. The intimate intermingling of the sphincter ani externus and the sphincter vaginae at the perineal center is well shown, indicating that these two muscles really constitute a strong muscular sling between the pubic arch and the coccyx.

fascia and the lower portion as the visceral pelvic fascia, but the two portions are really continuous with each other without any mark of separation except for the thickening at the "white line," *but they are separated* from the true obturator fascia. The origin, then, as usually given for the parietal pelvic fascia is really the origin for the visceral layer of the same as well.

The Levator Ani (and Coccygeus).—The levator ani shows two



FIG. 5.—Sagittal section of a female pelvis. A nullipara, eighteen years of age, injected and hardened in formaline then frozen and cut in the frozen state. The bladder was well filled when the section was made and has since partially collapsed. The uterus was crowded backward by the bladder until its long axis was vertical.

Note the almost vertical course of the vagina; the almost horizontal course of the anal canal, and the right-angle formed between it and the rectum. The shape and relations of the ano-coccygeal and perineal bodies can be easily appreciated.

distinct portions, the ilio-coccygeus and the pubo-coccygeus (pubo-rectalis).

The ilio-coccygeus is the portion arising from the "white line." It is inserted into the side of the rectum, the ano-coccygeal raphe or ligament and the coccyx.

The pubo-coccygeus (pubo-rectalis) arises from the inner surface of the pubis, passes backward alongside of the vagina to be inserted into the tendinous center of the perineum; and, sweeping around the rectum, it terminates in the ano-coccygeal ligament and coccyx. This portion of the muscle deserves further notice. Its fibers form a strong band (about three-eighths of an inch wide) which hugs the vaginal orifice very closely (forming the lateral compressor of the vagina), and is inserted in a "Y-shaped" manner. One leg of the "Y" terminates in the central tendon of the perineum, the other leg of the "Y" encircles the rectum and ends in the ano-coccygeal ligament.

The coccygeus muscle is relatively unimportant in this consideration. It arises from the spine of the ischium and the adjacent obturator fascia and lesser sacrosclatic ligament, it is inserted into the side of the coccyx and the lower end of the sacrum. The above statements are in conformity with the text-books. We find, however, they should be somewhat changed to agree with our dissections of the female subject.

The fascia of the pelvis being arranged in two layers as just given, the "true" obturator fascia and the parietal pelvic fascia, the origin of the levator ani muscle should be given in conformity with the dissections, namely, its *origin* is from the *outer surface* of the *parietal pelvic fascia* above the "white line." Some fibers of the anterior portion of the muscle even extend to the margin of the obturator groove and the iliopectineal line. This distinction is possibly without importance, except that it conforms to the usual findings at dissection. The result of this arrangement, then, is to make the *parietal pelvic fascia* really the *tendon of origin* for the levator ani muscle. So far as I can determine, the "white line" is *not* usually the *point of origin* for the *levator ani*, *neither* is it the place "along which the pelvic parietal fascia splits into the visceral pelvic fascia and the obturator fascia, neither does it give origin to the anal fascia" (see later). The "white line" is merely a thickening of the pelvic fascia along a narrow tract from the inner surface of the pubis to the spine of the ischium for the purpose of reinforcing the fascia at this place and unquestionably taking up much of the strain of the



FIG. 6.—Sagittal section of the pelvis of a female subject, a nullipara, about seventy years of age. Hardened in formaline, frozen and cut in the frozen state. Small squares of paper were pinned over the subpubic arch and the tip of the coccyx, also a strip of paper was placed within the vagina to make its lumen more apparent, as the two walls were in such close contact they did not differentiate readily. Among other things, note the shape, position and relations of the bladder; the position and course of the urethra; the course and relations of the vagina; the horizontal course of the anal canal, and the less-than-a-right-angle formed between the anal canal and the rectum; the size and shape of the ano-coccygeal and perineal bodies; and the very much atrophied uterus, in a normal anteflexed and anteverted position.

pelvic load and swinging it between the two bony points just named.

The Anal Fascia.—The anal fascia is usually described as a thin layer covering the lower surface of the levator ani muscle and arising from the obturator fascia immediately beneath the “white line.” As a matter of fact, this fascia is usually a well-marked one, or if thin in places has several dense portions in it, and, while it arises from the “true” obturator fascia (and not



FIG. 7.—Dissection of the female perineum. A. The pubis; B. the ischiopubic ramus; C. the ischial tuberosity; D. the great sacrospinous ligament; E. the external urinary meatus; F. the orifice of the vagina; G. the tendinous center of the levator ani muscle; H. the anus; K. is placed on the levator ani muscle and in the ischiorectal fossa; I. the perineal shelf. Upon it lie the superficial perineal vessels and nerves and the sphincter vaginae muscle.

from the parietal pelvic fascia), this origin may be half an inch or more (sometimes almost as low as Alcock's canal for the internal pudic vessels) below the level of the “white line.” With a low origin the anal fascia may blend laterally (as well as mesially) with the deep layer of the triangular ligament. If it has a higher origin, there is left a triangular osteofibrous space between the anal fascia, deep layer of the triangular ligament and the ramus of the pubes and ischium which is filled with fat. There is al-

ways a considerable quantity of fat interposed between the levator muscle and the anal fascia along their outer portions, but medially the two structures become intimately blended about the



FIG. 8.—Dissection of the levator ani muscle, especially the pubo-coccygeal (puborectal) portion with its “Y-shaped” insertion into the perineal center and the ano-coccygeal ligament. A. the symphysis pubis; B the tuberosity of the ischium; C. opposite the vaginal orifice just above the metal hook; D. the tendinous center of the perineum; E. opposite the anus; F. opposite the coccyx; between F. and E. is the sphincter ani externus; between F. and B. is the ilio-coccygeal ligament; in the centre of the picture is the ilio-coccygeal.

perineal center and the rectum. *These three structures*, the visceral pelvic fascia, the levator ani muscle and the anal fascia,

form the *pelvic diaphragm*. Whatever concerns one affects all three. While they may be separately dissected and demonstrated along their lines of origin, at their insertion they become so intimately interwoven with each other that it is no longer possible to demonstrate them as separate layers without severing their interlocking fibers, and forming artificial planes of cleavage. This intermingling of fibers forms posteriorly the strong

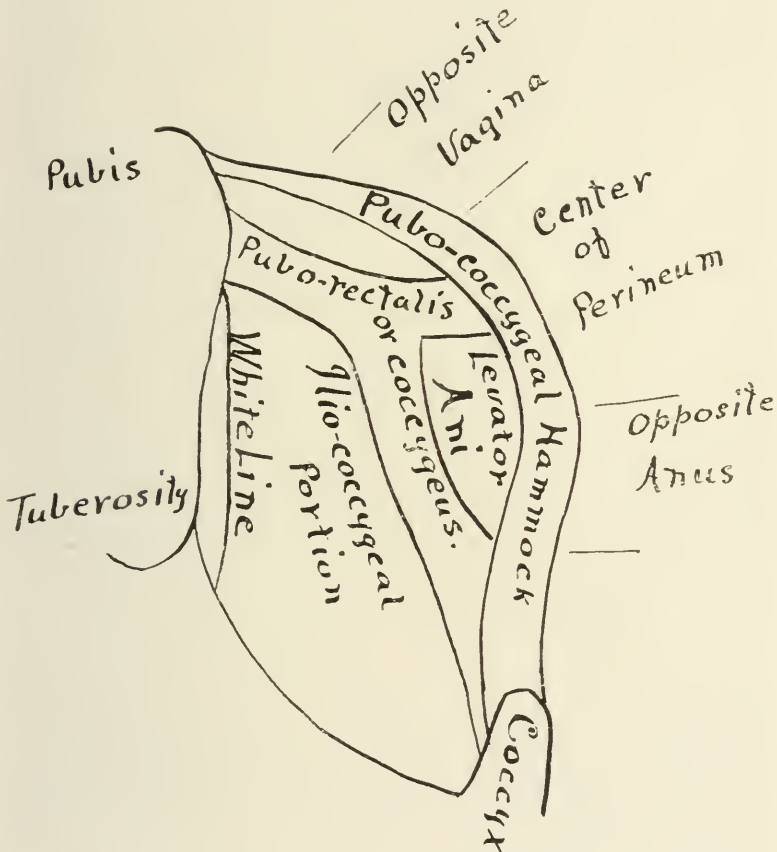


FIG. 9.—Diagram to explain Fig. 8.

ano-coccygeal raphe, or ligament, centrally they assist in building up a dense fibromuscular mass between the rectum and the vagina, the "perineal body," and passing into the rectum and vagina they strengthen and thicken their walls (the rectum more than the vagina).

The Perineal Shelf.—This partial partition at the front of the

pelvic outlet is formed by the two layers of the triangular ligament between which is inclosed the compressor urethræ (or vaginæ) muscle. These structures are attached laterally to the



FIG. 10.—Female cadaver which showed a typical laceration of the pelvic outlet. A. B. Opposite the posterior pair of caruncles which are widely separated by the old laceration. This specimen shows the characteristics of a ruptured pelvic outlet. The gaping orifice, the visible cystocele, the shortened perineum the tip of the rectocele and the relaxed anus are all apparent; C. opposite the clitoris; D. points to the external urinary meatus.

ischiopubic rami and the ischial tuberosities. Mesially, the superior or deep layer of the triangular ligament blends with the visceral pelvic fascia, the anal fascia and with the other fibro-

muscular elements of the perineal center. The compressor urethræ (vaginæ) muscle with the fibers of the deep transversus perinei forms a muscular layer extending transversely across the



FIG. 11.—Showing the flap-splitting process by which the vaginal and rectal walls are separated and the pubo-coccygeal portions of the levator ani muscle exposed.

subpubic space from one ischiopubic ramus to the other. These fibers pass behind (deep transversus perinei), and in front of

the vagina (*compressor vaginæ*), and the anterior fibers surround the urethra (*compressor urethræ*). The inferior or superficial layer of the triangular ligament is similar to the deep one

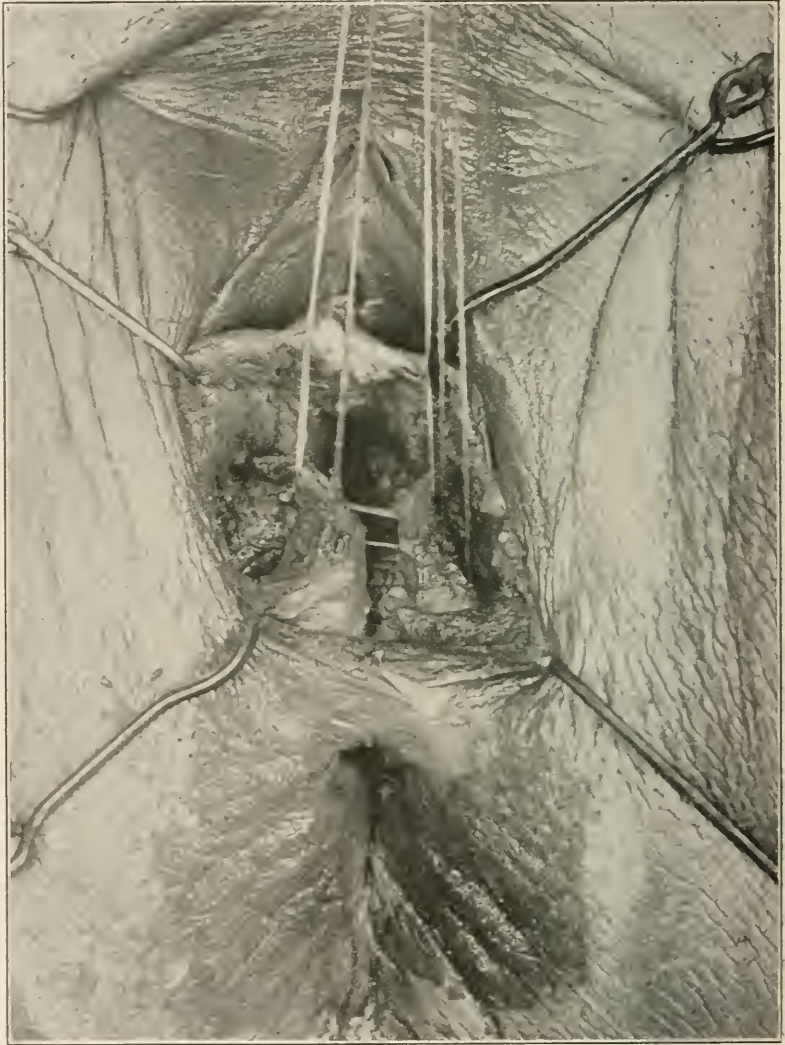


FIG. 12.—Sutures introduced into the pubo-coccygeal portion of the levator ani.

in its bony attachments. Posteriorly, it blends with the deep layer, with Colle's fascia and with the central tendon of the perineum. These layers of the triangular ligament with the in-

tervening muscle close up the anterior or perineal portion of the pelvic outlet, forming a strong but dilatible plane horizontally disposed, which I should like to speak of as the perineal shelf, in



FIG. 13.—The sutures into the pubic portion of the levator ani have been tied. This re-establishes the insertion of the pubo-coccygeus (pubo-rectalis) into the perineal center, and at the same time obliterates the rectocele.

order to drop lengthy descriptive terms and at the same time convey some idea of its function. The perineal shelf is pierced



FIG. 14.—The sutures which bring together the ruptured "perineal body" have been placed and tied. The manner in which this builds up the perineum can be easily demonstrated by consulting the preceding photographs. By these sutures the insertion of all the superficial muscles into the perineal center is re-established and the "perineal body" restored to its normal condition.

by the vagina and the urethra and some minor structures which do not require mention.

The Pubo-coccygeal Hammock.—By this term I wish to group together parts which are usually described and considered separately, but which are very closely related anatomically and functionally.

The pubo-coccygeal hammock is formed by the sphincter ani externus and the sphincter vaginæ which, stretching from the pubis to the coccyx, form a veritable muscular hammock surrounding, closing and supporting the lower portions of the rectum (anus) and vagina. Separately considered, these muscles are disposed as follows:

The sphincter vaginæ has its anterior attachment into the crura and base of the clitoris and into the subpubic ligament and the adjacent pubic arch; its posterior attachment is into the central perineal tendon. The sphincter ani arises from the tip and sides of the coccyx and the ano-coccygeal ligament, its anterior disposition is into the central perineal tendon also. The central attachment of these muscles deserves a more detailed statement. We find here the fibers of the two sphincters intimately blending with each other and, also, with the fibers of the two transversus perinei, forming an interlacement of muscular and tendinous fibers which, with those just mentioned from the levator muscle and its fasciæ and the structures of the triangular ligament, produces a mass of muscular and fibrous tissue which is described as the "perineal body." It is placed between the anus and the vaginal orifice, where it measures one and five-eighths of an inch in an anteroposterior direction and extends upward for one inch between the anal canal and the vagina.

The anterior fibers of the sphincter ani spread out fan-shaped and terminate not only as given above, but also by being attached to the superficial layer of the triangular ligament. It requires no stretch of fact or fancy to conclude that this ligament answers as the tendon of insertion for a portion, at least, of this muscle.

The pubo-coccygeal hammock is anchored and supported laterally to a small extent by the comparatively weak superficial transversus perinei muscles. These pass between the central perineal tendon outward and backward to the ramus and tuberosity of the ischium.

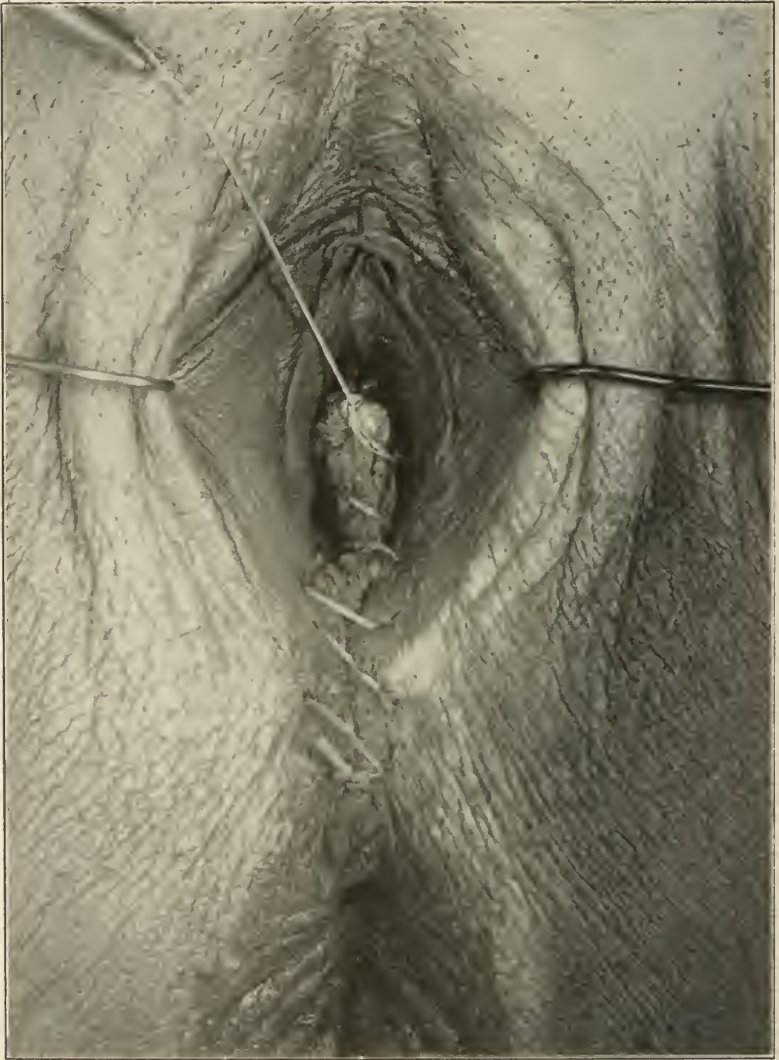


FIG. 15.—Suturing the flap formed of the posterior vaginal wall in a vertical direction. A small gap is left at the posterior end of the incision.

Note that the posterior pair of carunculae, which are shown in Fig. No. 10 have been brought in contact with each other, thus restoring the outlet to its normal condition. In the living this line of suture should be made with No. 2 ten-day chromic gut and placed in a neater manner than shown here.

II. THE FUNCTION OF THE FOREGOING STRUCTURES.

The first statement I wish to emphasize is that while the various structures participating in the closure of the pelvic outlet have their own particular function, in their action, one cannot be considered alone and separate from the other elements. They all act in harmony and all to the same end, namely, for the preservation of the integrity of the pelvic outlet and in maintaining intraabdominal pressure, whether it be in micturition, defecation, copulation or parturition; or in resisting the increased action of the abdominal muscles and the diaphragm in various other bodily functions, as vomiting, coughing, sneezing and the like.

These features of the subject should be kept in mind:

1. The pelvic outlet is closed by a diaphragm formed of three intimately related structures: the visceral pelvic fascia, the levator ani muscle and the anal fascia.

2. The anterior portion of the outlet is further reinforced by the perineal shelf, composed of the two layers of the triangular ligament inclosing between them the compressor urethræ (*vaginæ*) muscle.

3. Lastly, there is the pubo-coccygeal hammock formed by the sphincter ani externus, sphincter *vaginæ* and the transversus perinei muscles.

These in whole or part are traversed by the urethra, vagina and anal canal and by other structures not pertinent to our consideration.

What is the mechanism by which they sustain the pelvic load? We may note that if the female went on all fours and did not assume the upright position it would take very little muscular effort to block up the pelvic outlet and resist the intraabdominal pressure, and even if in childbirth a torn canal resulted there would not follow the dire results which now attend such lesions.

We must then examine the pelvis and its intrinsic parts in the normal *upright position*. This is obtained by holding the pelvis so that the anterior superior spines of the ilium and the symphysis pubis are in the same vertical plane. By careful examination of the living woman standing you will find that this position is correct. Studying the pelvis and its contents in this normal upright position, we are impressed with several important facts:

1. The "white line" forms an angle above the horizon of thirty-three degrees. This angle is open to the rear.



FIG. 16.—Labia widely separated to show how the sutured posterior vaginal wall does not (even in the cadaver) obstruct the vaginal outlet. In the living this excess of tissue will gradually disappear.

Note the depth of the perineal body. Compare with Fig. No. 10 to see how the perineum has been built up between the vagina and the anus.

2. The iliococcygeal fibers of the levator ani pass only slightly backward, but *mostly downward* into the rectum, ano-coccygeal raphe and the coccyx.

That the pubo-coccygeal (pubo-rectal) portion of the muscle takes a course *almost horizontally backward* around the vagina to its insertion into the perineal center, rectum, ano-coccygeal raphe and coccyx.

The coccygeus muscle can be disregarded in this consideration, as it has no bearing upon the later aspects of the subject. It merely completes the pelvic diaphragm by closing up the gap left between the levator ani, great sacrosciatic ligament, the side of the coccyx and the end of the sacrum.

3. The perineal shelf forms an angle with the horizon of only 3 to 5 degrees. The angle is below the horizon and opens to the rear. The angle is so small that *practically* the *perineal shelf* is in a *horizontal plane*.

4. The course of the vagina from the uterus to the surface is either straight or very slightly curved, the concavity being directed forward or the upper two-thirds maintains this forward curve and the lower third turns slightly backward.

The vagina lies close to the pubic arch, being distant from it (in formaline hardened specimens) seven-eighths of an inch (the urethra intervening). The posterior wall of the vagina is in close contact with the anterior.

5. While the vagina and the rectum are in close contact above the pelvic diaphragm, below this septum they rapidly diverge.

This separation is caused by the abrupt backward turn that the anal canal makes with the rectum. The angle between these two portions of the gut varies from a little less to a little more than 90 degrees. The distance of the apex of this recto-anal angle from the subpubic angle is one and one-fourth inches. The long axis of the anal canal is at an angle of 15 degrees or less with the horizon.

6. The space between the anal canal and the vagina is filled in by the perineal body, 1 inch in depth and $1\frac{5}{8}$ inches measured along the perineal raphe.

7. The vaginal and anal orifices are inclosed within and supported by the fibers of the pubo-coccygeal hammock, and the center of the vaginal orifice at the hymen is one-fourth of an inch lower than the center of the anus.

WHAT PREVENTS PROLAPSE OF THE PELVIC VISCERA?

Examination of the specimens and investigation upon the living show conclusively that the *levator ani muscle* and especially its pubo-coccygeal (pubo-rectal) portion is the *important contractile element present*.

Examination of the living woman with intact pelvic outlet shows the two (anterior and posterior) vaginal walls in close contact with each other; the anterior wall is so close to the sub-pubic arch that it really appears to lie immediately against it, except for the urethra intervening between the two along the center.

By pressing strongly backward, the vagina is opened and the two band-like bundles of the pubic portion of the levator muscle will be felt on either side. If now the woman is asked to contract her muscles you will feel the finger drawn up to the pubic arch by the forcible contraction of these bundles as they draw the rectum (recto-anal angle) and perineum forward. By this mechanism the vagina is firmly closed. At the same time the rectum, at the recto-anal junction is primarily closed laterally by the contraction of these same bundles and drawn bodily forward toward the pubic arch. The lower portions of both canals are maintained in a closed state by the action of the two superficial sphincters.

While the levator ani is the efficient cause for the closure of the pelvic outlet, we must not lose sight of the fact that the upper and lower fascia of the muscle greatly assist in this function.

These layers bind the rather loose fibers firmly together, bridge over weak places in the muscle thus solidifying it and conserving the action of the entire muscle. The strong horizontal perineal shelf at the anterior portion of the outlet plays an active part through its insensitive nature in sustaining the pelvic load without fatigue, and the active muscular arrangement forming the pubo-coccygeal hammock must contribute not a little in assisting the pelvic diaphragm in its function.

III. LACERATIONS OF THE PELVIC OUTLET.

How Produced.—The lesions considered in this paper are produced at childbirth by the passage of the child through the parturient canal, either unassisted or aided by the use of the forceps.

Probably the premature application of the forceps or their

faulty adjustment or ignorant use contribute to the production of tears of the pelvic outlet. Indeed, it is probable that the rarer form of rupture of the levator ani muscle close to the pubic arch is due solely to the cutting action of the blade of the badly applied or used forceps.

At birth, then, the child must pass through the pubo-coccygeal (pubo-rectal) loop of the levator muscle, through the gap in the perineal shelf, and through the vaginal slit in the pubo-coccygeal hammock.

This passage is usually made without any material damage when the normal conditions affecting mother, child and time prevail by the gradual stretching of the structures composing the different layers. However, there may be such a disparity between the size of the child and the potential passageway or the birth so precipitate that all the structures are torn through into the rectum or into the ischio-rectal fossa. Between these two extremes there are all grades of lacerations.

Extent and Location of the Lacerations.

Lacerations of the more superficial structures, *i.e.*, the perineum itself, independent of the pelvic diaphragm, may occur. When these are shallow they produce no symptoms and need not detain us. If of a more severe character—into the anus, for instance—they may be dealt with by the operative procedure given in the following pages.

The serious lesions are tears in the pelvic diaphragm, alone or associated with those of the perineum.

These lesions are situated opposite the posterolateral angles of the vagina and are usually bilateral, but the left side usually suffers more than the right. When they are limited to one side only, it is the left which is usually affected.

These lacerations extend for varying distances into the ischio-rectal fossæ, severing the pubo-coccygeal (pubo-rectal) bundles of the levator muscle, the transversus perinei deep and superficial, the triangular ligament and the common attachment of the sphincter ani and sphincter vaginæ.

If the rupture is in the median line the parts are severed toward, up to and even into the anal canal (possibly into the rectum). If the rarer form of laceration is present, the pubic portion of the levator muscle is torn off close to its origin from the pubic arch. Cervical lacerations, rupture of vessels and damage to the urethra, bladder or other parts are not considered in this connection.

IV. EFFECTS OF PELVIC LACERATIONS.

Superficial median tears produce no symptoms and require no treatment. Lesions of the pubic portion of the levator ani muscle and fasciæ, unless repaired at their inception, will be followed by very serious results as the action of the most important portion of the muscle is lost. The rectum is not drawn firmly against the vagina and both against the subpubic arch. There is, therefore, no support to the anterior wall of the rectum, neither is there any posterior support for the vagina. This loss of sustaining force is felt by the rectum, vagina, bladder and other pelvic viscera. Beginning with the lowest structures and working upward, these viscera gradually fall out of the pelvic cavity through the gap left between the subpubic arch and the ilio-coccygeal loop of the levator muscle. The extent of their fall is limited only by the length to which the ligaments, vessels and nerves which pass to them will stretch in the given period of time.

This fall is aided by the intraabdominal pressure from above. There is thus produced the ordinary rectocele, cystocele and pouting vagina. Later the uterus and its adnexa and the remaining contents of the pelvic cavity participate in the downward movement.

In speaking of the supporting function of the pelvic floor I have used the term of the "pelvic load" because the weight to be borne is not merely rectum and vagina alone, nor bladder and uterus, but it is in reality the entire column of visceral structures which reach from the pelvic floor to the diaphragm, plus the force exerted by the contracting muscles bounding the abdominal cavity in producing and maintaining the intraabdominal pressure. When the pelvic floor is incompetent to sustain this load there is a displacement of it downward, and the parts to show this displacement or prolapse first are those in closest proximity to the breach in the floor. While Nature has arranged to support these organs by numerous ligaments and vessels with the enveloping connective tissue, and they fully perform this function while the pelvic floor is intact, and while they can support the load for a time even if the pelvic floor is damaged, yet, after a variable time in this last condition, these ligaments gradually stretch, the viscera drop downward and a condition of prolapse of the organs becomes evident. The superimposed abdominal viscera also share in this downward movement.

Diagnosis of Pelvic Lacerations.—Inspection shows a pouting, swollen, open vaginal orifice, through which may be seen the tip of a rectocele and a cystocele. The anus is relaxed and prominent.

The interval between the vaginal and anal orifices may be greatly reduced and even destroyed.

A cicatrix fills the interval between the posterior extremities of the labia. The anterior limits of this cicatrix is usually indicated by the most posterior pair of caruncles. (These caruncles also indicate the points between which the mucocutaneous incision extends.)

Digital examination confirms the general thickening, swollen and lax state of the parts. The cervix will usually be encountered close to the vaginal orifice. Pressure backward encounters no resisting pubo-coccygeal bundles of the levator ani, and, upon voluntary effort by the patient, there is no muscular action of these fibers to compress the vagina, and to draw the rectum (recto-anal angle) forward toward the subpubic arch. There is only a weak lifting of the anal portion of the perineum, due to the action of the ilio-coccygeal portion of the muscle. A finger in the rectum finds the anterior wall of the recto-anal angle ballooned out and projecting downward and forward into the vagina as the rectocele. A sound in the bladder shows that there is a similar pouching downward and backward of its base so as to produce the cystocele.

The uterus and adnexa in the early stage of the process may show no disturbance in position, but later they all share in the downward movement, and this may go on until the uterus projects through the vaginal orifice, and the adnexa are prolapsed into the funnel-shaped pouch of Douglas. Between these extremes there are all degrees of displacement. Prolapse of the intestines will be sure to keep pace with the fall of the pelvic viscera, and all sorts of abdominal ptosis may be associated with a ruptured pelvic outlet.

REPAIR OF PELVIC LACERATIONS.

This paper is confined to the treatment of pelvic lacerations, even though such lesions are followed by all the pathological conditions mentioned above, as cystocele, rectocele, uterine displacements and numerous other pelvic conditions. I do not intend to rehearse all the measures which should be instituted for the relief of such conditions as it would unduly lengthen this

paper and confuse the real point I wish to emphasize, viz., the proper repair of the ruptured pelvic floor.

Besides the operation advocated for this lesion, the other pathological states demand surgical treatment, and, although these measures will not be outlined here, it is understood that they should be done.

The mechanical features of rectocele, cystocele, displacements of the uterus, tubes and ovaries; the functional ones of constipation, disturbed micturition, abnormal menstruation, congestion and inflammation of the pelvic viscera; and the mental ones of growing discomfort to actual distress in the pelvic region and reflected areas, bring the woman with a lacerated pelvic outlet to the operating table.

Until Emmet made the distinction clear between lacerations of the levator muscle and the "perineal body," the operations proposed for the relief and cure of these conditions had no anatomical or logical foundation. Emmet demonstrated that there could be an extensive tear of the "perineal body" without any other symptoms objective or subjective, and, that there were cases with intact perinei in which existed prolapse of all the pelvic organs.

The essential distinction is as has been already pointed out that in the latter case the levator muscle has been torn while in the former it remains uninjured.

The lesion then is situated in the pubo-coccygeal (rectal) portion of the levator ani muscle. It is usually at the posterolateral angle of the vagina, and it may be unilateral but is usually bilateral. Median tears may also exist. The treatment of these conditions is the same. The problem is how to expose the parts and repair the damage.

There have been any number of operations proposed, but they all may be grouped under two classes, denudation and flap splitting. While I have performed both operations many times, the denudation method first and later the flap-splitting operation, I must say that to my mind, the latter plan is the only one which, when carried out to the extent here advocated, will fulfill all the indications demanded.

It is founded on true anatomical and surgical principles, and the results prove its correctness.

By the flap operation no tissue is lost, the exact site of the lesion is exposed, viz.: the levator ani and its enveloping fasciæ, the sphincter ani and the transversus perinei. The operation is

easy of execution and rapidly performed. All sutures are buried and do not require removal.

The Operation.—The incision is made with scissors along the mucocutaneous border of the vaginal orifice, from the anterior margin of the cicatrix on one side to a similar point on the other side. This forms a “U-shaped” incision.

With scissors and fingers the vagina and the rectum are quickly separated from each other, from the perineum to the highest point of the rectocele, and laterally so far outward as to sever all the cicatricial bands and fully expose the margins of the levator ani muscle. Two or three chromic gut or kangaroo sutures are placed in the margins of the levator ani, taking care to pass the needle outward, deeply enough to get a firm hold of the muscle and its fasciæ. The number of sutures depend upon the width of the gap to be corrected, and no fixed number can be given; place enough to obliterate the rectocele and properly close the gaping vagina.

Control hemorrhage, which will be quite free, but as it is mostly venous pressure and hot sponges are usually sufficient, and tying the sutures in the muscle will arrest what remains. Next place one, two, or three sutures of the same material in the lateral surfaces of the wound superficial to the levator muscle. These sutures are placed deeply and they must necessarily without further dissection, gather up the sides of the severed perineal body and bring once more into a central insertion the sphincter ani externus, sphincter vaginæ and the transversus perinei muscles, and, furthermore, they will also reunite the deeper parts of the perineal shelf.

The operation is finished by suturing the “U-shaped” incision vertically with No. 1 or 2 ten-day chromic gut. There is a small gap purposely left at the posterior angle of the incision for drainage, as there will be some oozing for the first twenty-four hours. The redundant flap of vaginal tissues is tucked into the vagina and the operation completed.

This operation gives perfect and complete exposure of the damaged structures at the site of the lesion. The reformation of the central attachments of the various structures of the pelvic diaphragm, perineal shelf and pubo-coccygeal hammock cures the rectocele, restores the vital action of the pubo-coccygeal bundle, brings the posterior wall of the vagina forward against the anterior, narrows the vaginal canal to its proper size, reforms the pelvic floor, furnishes a firm support for the intraabdominal

pressure and a solid basis for any further work upon displaced pelvic viscera.

If such a repaired outlet is carefully examined two or three months or years after the operation you will notice these points of improvement. The vaginal orifice is not gaping but closed. There is the normal space between the vaginal and anal orifices, and the perineum has its normal contour. A finger in the vagina shows its two walls in contact, and if the muscle is called into action the finger will be carried against the subpubic arch by the forward movement of the rectum (recto-anal angle). Furthermore, the perfection of the result is asserted by the patient and proved by subsequent childbirths.

1125 MADISON AVENUE.

THE INTRAABDOMINAL ROUTE FOR THE REMOVAL
OF CALCULI FROM THE PELVIC PORTION OF
THE FEMALE URETER.*

BY

DOUGAL BISSELL, M. D.,

New York.

(With Four Illustrations.)

THE longitudinal division of the ureter for the purpose of exploring its lumen, or removing calculi, technically called ureterotomy, has been accomplished through various routes but the object of this paper is to advocate the removal of calculi from the pelvic portion of the female ureter by the intraabdominal or transperitoneal route.

Since Novaro (1) first demonstrated in the human subject the possibilities of combined intra- and extraperitoneal ureteral surgery, through the intraabdominal route, little has been accomplished to recommend it as the route for selection. Although the authorities (2) are almost unanimous in their condemnation of it, claiming that the risk of contaminating the peritoneum is altogether too great, I am of the opinion that it possesses advantages with less risk than is supposed.

Gynecological work of to-day is chiefly intraabdominal. The knowledge of pelvic pathology and familiarity with pelvic anatomy and perfected operative technic make the gynecologist especially fitted for intraabdominal ureteral surgery. So well able is he now to protect the peritoneum from possible infection

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or limit the area of contamination, that he should no longer hesitate to operate within this cavity if by so doing he can insure an exactness not otherwise obtainable. Much of the work upon the pelvic portion of the ureter has been done upon the female, and our knowledge of ureteral anastomosing has been derived chiefly from this source. The results obtained have been most encouraging, yet we do not designedly explore the ureter or remove foreign bodies from it by this route, with which we are most

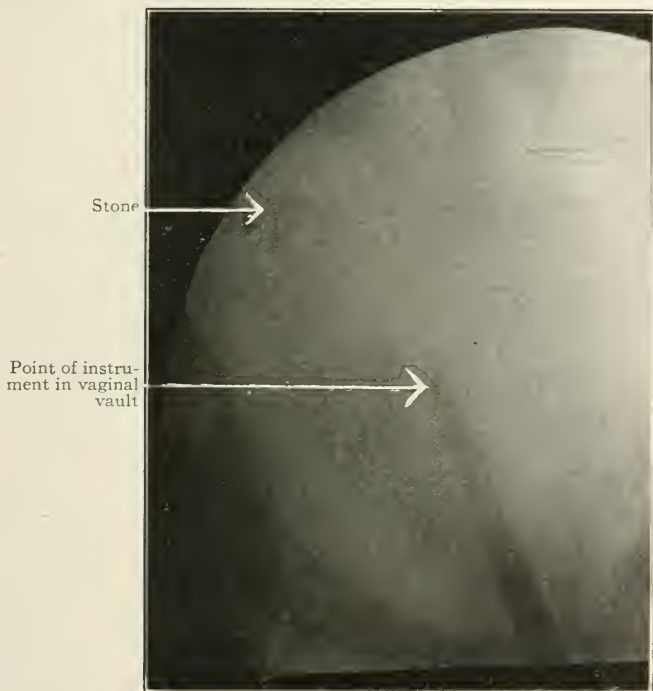


FIG. 1.—In the reduced radiograph the shadow of the thickened ureter is lost, and that of the stone very faint. The instrument indicates the direction of the vagina, and its point touches the thickened portion of the ureter.

familiar, and where we daily combat the many sources of possible danger.

The following history is that of a case of impacted ureteral calculus, situated near the middle of the pelvic portion of the right ureter, the removal of which was planned and executed intra-abdominally, through the median incision:

Mrs. C., referred to me by Dr. W. Allan Bartlett, was admitted to the Woman's Hospital on September 9, 1907, aged

thirty-nine years, married, two children, one miscarriage. Last menstruation, September 6, 1907. She gave the history of having been ill off and on for fifteen months. At intervals of one to three months she would have "gnawing" pains in region of right kidney, lasting on each occasion several days. A chill generally accompanied the attack. No pus, blood or "gravel" was seen in the urine till two months ago, when these appeared

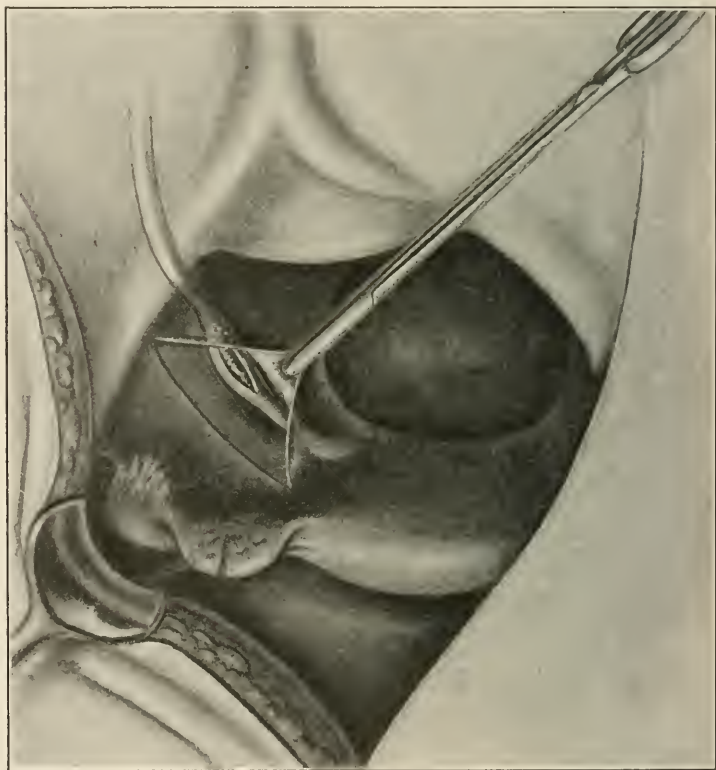


FIG. 2.—Stone *in situ*. Ureter incised. Peritoneal flap separated from region of ureter.

with frequent and painful micturition. There was more or less distress in the region of the appendix. Appetite and general condition good, but within the past few months had lost ten pounds. Previous health good; no history of cough. Great-grandfather died of tuberculosis. On admission, temperature was 97.2°; pulse, 116; respiration, 20.

Vaginal examination revealed a pronounced thickening along

the vesical portion of the right ureter, which thickening could be traced as high up in the vaginal vault as the finger could reach. The vesical portion of the left ureter was also thickened, but not to the same degree. No marked pain was elicited on pressure in the vaginal vault, but on bimanual examination pain was elicited deep in the right pelvic region.

Report of Urine.—Specific gravity, 1011; reaction slightly acid; oxalates in solution not increased; indican, large amount; phosphates absent; urates absent; uric acid absent; calcium oxalate absent; few red blood-corpuses; large amount of pus; casts absent. Examined by E. E. Smith.

The radiograph by Dr. L. G. Cole showed a shadow along the entire line of the pelvic and vesical portions of the right ureter. In the middle of the pelvic portion this shadow was intensified.



FIG. 3.—Actual size of stone.

There was a slight shadow of the vesical portion of the left ureter. No shadow was seen in the kidney regions.

Through the cystoscope the bladder wall was seen to be studded with innumerable little cysts, and the mucosa greatly hypertrophied. The region about the mouths of the ureters was so engorged that it was impossible to catheterize either ureter.

The diagnosis was ureteritis, with phosphatic deposit in the right ureteral mucosa. Probable impacted stone in the pelvic portion of the right ureter.

The operation was performed September 10, 1907. A median abdominal incision 10 cm. in length was made. A digital exploration of the right pelvic region discovered an impacted stone in the middle third of the pelvic portion of the right ureter, or about 7 cm. from the pelvic brim. The entire ureter up to the pelvic brim was found markedly thickened. There was little or no thickening of the left ureter beyond the base of the broad ligament.

The uterus, ovaries, and tubes were normal. The entire bladder wall was greatly thickened.

The patient was placed in an extreme Trendelenburg posture. The intestines gravitating toward the diaphragm were kept away from the pelvis by means of gauze pads. Other gauze pads were

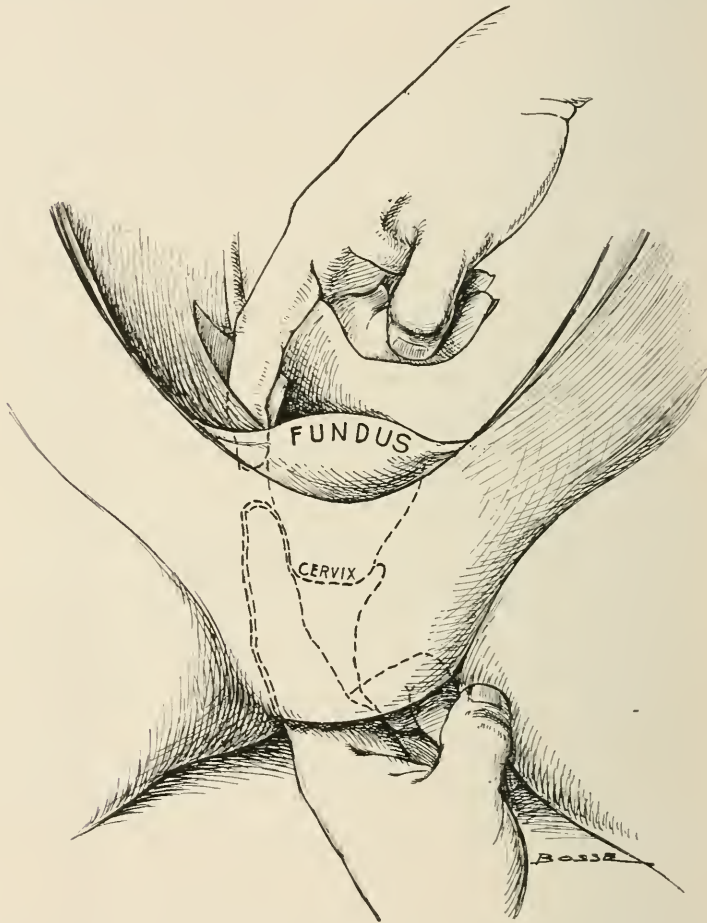


FIG. 4.—Showing the fingers in the vagina and at the base of the retroperitoneal space to direct puncture through vaginal vault for provisional drainage.

placed so as to cover the entire pelvic peritoneum, excepting the region of the right ureter. The right ovary was penetrated with a catgut suture and anchored to the tissues above the right broad ligament, the object of this being to remove the ovary and tube from obstructing the view of the ureter. The entire pelvic por-

tion to the base of the broad ligament was then clearly seen, and the position of the stone was easily discerned, even by the spectators.

The plan adopted to remove the calculus was as follows: An incision of the peritoneum was made at a point about 3 cm. above the site of the calculus. This incision was continued several centimeters in both directions parallel with the ureter. The peritoneum was then grasped with a long forceps and separated from the adjacent pelvic tissues, exposing the ureter several inches. Intraperitoneally the ureter could be easily recognized to and beyond the brim of the pelvis, and in order to avoid a leakage of the damned up urine in the duct upon the extraction of the stone, a probang sponge was placed upon the ureter where it passed over the pelvic brim. A longitudinal incision was then made in the exposed ureter immediately over the calculus, and through this the calculus was removed. Through this ureteral incision a ureteral catheter was passed upward to the kidney (the probang sponge being removed to allow its passages), and $3\frac{1}{2}$ ounces of thick, purulent fluid were drained from the pelvis of the kidney. The pelvis of the kidney was then washed out through the catheter until the fluid returned practically clear. By this means it was determined that the right kidney was the probable seat of pathological changes, which supposition proved subsequently to be the case.

Examination of the urine drawn showed chiefly pus, no tubercle bacilli, and but a few staphylococci. The catheter was next passed downward and into the bladder; it met with no real obstruction, but there was noticed a slight resistance near the beginning of the vesical portion of the ureter, which was probably due to some phosphatic deposit in the hypertrophied mucosa of that portion of the duct.

The patency of the entire canal thus being insured, the ureteral incision was closed with eight No. 0 plain catgut sutures, each penetrating the walls of the ureter down to the mucosa.

The next step was to continue the separation of the peritoneal flap by blunt dissection with the finger along the line of the ureter to the vaginal vault. A finger of the other hand was placed in the vagina, and at a point where these fingers met a puncture was made and provision for drainage established by means of a narrow strip of iodoform gauze. The flap of the peritoneum was then sutured to its original position with No. 0 catgut, and the ovary and tube replaced.

The calculus was of phosphatic character, $1\frac{1}{2}$ cm. in length and $\frac{3}{4}$ cm. in diameter, and dry weight $4\frac{1}{2}$ grains.

The appendix was next examined and found to be markedly diseased and removed. It might be here stated that some time previous to this operation a diagnosis of appendicitis had been made by another surgeon and the operation seriously considered. The microscopic examination of the appendix showed positive pathological changes, thereby establishing the previous diagnosis. Had an extraperitoneal method alone been adopted, opportunity would not have been afforded for the examination or removal of this organ.

The abdomen was closed in the usual manner. The strip of gauze in the vagina was removed in thirty-six hours. No leakage; recovery.

The case related presented, at time of operation, every element of danger feared by those who consider the intraabdominal route unjustifiable—yet its success was absolute. In considering the method of attack I was persuaded to adopt the plan here described because my familiarity with the intraabdominal route gave me a confidence which I could not have possessed in any route less familiar. By the use of Trendelenburg's posture I gained an unobstructed view of the pelvic floor. By the proper placing of gauze pads the peritoneum was well protected. The organs brought into view could be examined and all associated pathological conditions corrected. While these advantages were important factors in selecting the route, the device adopted to enable me to work retroperitoneally upon the ureter was of primary importance. I objected to the extraperitoneal methods because the incision involved more extensive tissue area, with greater liability to injury to important structures. They offered but a limited field for vision and reparative work upon the ureter, and no opportunity to examine adjacent organs or to correct associated pathological conditions that might exist intraperitoneally. Also, if the peritoneum about the calculus be damaged as the result of erosion or ulcerative change, it would be difficult to appreciate this damage, and even more so to protect properly the peritoneal cavity if accidentally invaded.

The feature of special importance in the method adopted, and that which placed the ureteral work out of the field of intraperitoneal surgery, strictly speaking, was the peritoneal flap secured from the region immediately above the ureter in

such a way as to create a roomy retroperitoneal space in which ureteral work could be easily accomplished. This flap could be so manipulated as to make an effectual barrier to possibly septic urine, if at any time such escaped through the ureteral incision. From behind this flap the stone could be removed with safety, and the entire ureteral canal also explored and the pelvis of the kidney catheterized with surprisingly little difficulty. Not only could the pelvis of the kidney be drained, but if so desired, as was done in this case, it could be thoroughly irrigated through the end of the catheter which extends out of the abdominal wound. Conditions are usually such as to admit of the formation of this retroperitoneal space, which space can always be so extended as to form a junction with the vaginal vault, thereby insuring an extraperitoneal vent for leakage. Although a good view is afforded of almost the entire length of the ureter through the intraabdominal route, the removal of a stone and the repair of the ureter in the broad ligament portion becomes more and more difficult as we approach the vesical portion. When, therefore, a stone is found lodged at a point where manipulation posterior to the broad ligament is difficult, the severing of the round ligament and separation of the surfaces of the broad ligament down to its base (similar to the way described by me in 1901, for ureterovesical grafting) will furnish a large retroperitoneal space in which work upon the ureter can be accomplished with equal ease. These ligaments should be restored in the manner advocated by me in operating for retrodisplacements.

If the stone is situated in close proximity to the base of the bladder—that is, immediately below the uterine artery and about the plexus of veins derived from the lower part of the uterine and the upper part of the vaginal plexuses—difficulties and dangers may be encountered which may make the work hazardous; under these circumstances ureteral lithotomy, per vaginam, or suprapubic cysto-ureterotomy should be considered.

If a movable stone is discovered above the pelvic brim during an intraperitoneal operation, its passage into the pelvic portion of the ureter should be encouraged and its removal accomplished according to the method here described.

There is diversity of opinion regarding the necessity for suturing when lithotomy has been performed through the longitudinal incision of the ureter. Van Hook and others think it unnecessary; that the wound always takes care of itself kindly, and should be abandoned with drainage (3). I fail to

appreciate the advantage of purposely leaving conditions such as will encourage either a temporary or permanent fistula, and believe that, with the surgical knowledge now at our command, it is our duty to repair the ureteral incision in order to lessen the chances of either or both. If the work is done with the same exactness as is demanded under all other surgical conditions we can reasonably expect the same result. The causes of failure may usually, with justice, be ascribed to the inexactness of the work, either because of the want of skill on the part of the operator, or the difficulty of manipulation through the side incision when the pelvic portion of the ureter is the seat of operation.

Little or no tension on the sutures follows the longitudinal repair; therefore, soluble No. 0 plain catgut, which will keep in apposition the cut edges of the wound thirty-six or more hours, is all that is necessary. Such material has the advantage of dissolving, should union fail, thereby lessening the liability to future complications. A wound which heals by granulation contracts, and the slightest encroachment upon the caliber of the ureter necessarily increases the liability to lodgment of calculus, should it recur.

The same principles govern drainage here as govern all other cases where the question of drainage is to be considered. If the operator has not previously protected the neighboring peritoneal surfaces, and thus limited the field of possible contamination to the immediate area involved, the drain is of questionable value. In the case related the strip of gauze was placed in the retroperitoneal space, extending into the vagina, with the double object of providing for possible ureteral leakage, or drainage of any infectious material which might have been deposited retroperitoneally at time of operation. Had the surfaces become contaminated intraperitoneally, I should have provided, in addition to the retroperitoneal drain, an intraperitoneal drain, passing it through Douglas' cul-de-sac, also into the vagina.

Symptoms of ureteral calculus sometimes simulate those of renal calculus; blood and pus are usually found as prominent symptoms in both, and pain is also a common symptom. When the stone is situated within or upon the kidney structure, the pain is usually dull and subacute and referred to the region of location, but when situated in the ureter, the pain (usually spasmodic or "colicky") may be referred to either the ureteral or kidney region, its severity varying with the amount of ureteral distention

which, in turn, depends on the amount of obstruction. When particularly severe along the course of the ureter, it is usually consequent upon the change of position of the stone, due to accumulated pressure in the ureter.

When the stone is located at the base of the broad ligament within reach of the finger, distress is usually elicited upon examination. Shadows in the ureteral region may be due to other causes than calculi. Leonard (4) has shown that certain small shadows in the tract of the ureter were occasioned by the presence of phleboliths or calcified lymph glands. Caldwell (3) believes that the shadow may sometimes be due to a sesamoid bone, such as is occasionally found in one of the obturator tendons. Seelig (6) misinterpreted a shadow of a concretion in the appendix and operated for a stone in the right ureter. Calcified areas in the ovary may also be misleading. Lilienthal (7), in an article on ureteral surgery, draws attention to the possibility of error in determining by radiograph the exact position of the stone. As he states it, "The angle of the projection line of the calculus with the plane of the plate may give rise to error in localization." This mistake, if made by an operator undertaking to remove the calculus from the pelvic portion of the ureter, through the side incision, may result in confusion; but if the intraabdominal route is chosen, this error is of little consequence.

A nonimpacted ureteral calculus may change its position from day to day, and at time of operation it may differ materially from that depicted at time of radiography, but the change of position will not be misleading if the intraperitoneal route is adopted. The *x*-rays may be corroborative or suggestive, but are not always a source of positive information. Conditions at times will so confuse even the skilled interpreter of the radiograph as to make him unwilling to express a positive opinion concerning the existence or nonexistence of a stone. However, it is a source of possible information, and should always be made use of.

"Ureteral catheterization upward from the bladder . . . may detect an obstruction and localize its situation, but it cannot always differentiate a stone from stricture of the ureter" (8). Howard Kelly's wax-tipped catheter, valuable as it is, does not always furnish the desired information. Moreover, cases arise, as in the one under consideration, where catheterization of the ureter upward from the bladder is practically impossible, on account of the extreme hypertrophy of the bladder wall.

Bovée (9) reported, in 1905, a successful intraabdominal oper-

ation for the removal of a very large ureteral calculus, situated at the base of the right broad ligament. The celiotomy was not done with the expectation of finding a stone (the mass felt per vaginam not being considered such), but the removal through this route was justifiable; to have resorted to any other route would, in my opinion, have given more difficulty and subjected the patient to greater danger. The technic he adopted is open to criticism. The incision in the ureter was made directly upon the mass, and on the removal of the stone a certain amount of the ureteral contents escaped into the peritoneal cavity. The surfaces of the broad ligament could have been separated so as to have protected the peritoneal cavity, and through this retroperitoneal space so created provision for leakage established per vaginam, avoiding thereby intraperitoneal drainage. The repair of the ureter was made with two layers of sutures, while one passed through the entire ureteral structure down to the mucosa is sufficient to insure apposition and union. Bovée further expresses the opinion that if a stone with rough surfaces be lodged at any one point for a considerable time, occasioning a corrosive action upon the ureteral wall, it should be removed through an incision at some point above the lodgment, as such erosion will interfere with union if the operation is done at the point of lodgment. But a stone which would, from size or roughness, cause erosion of the ureteral wall, would also, on being removed through an opening at some point above its lodgment, inflict damage to the mucosa between these points. The stone removed in the case reported by me was much larger than the caliber of the ureter; it was also rough and embedded in the mucosa and showed every evidence of having been lodged, where discovered for a considerable time. It was removed, as stated, at the point of lodgment, with resulting primary union.

In a recent article by John H. Gibbon (10) there is described a procedure adopted by him, which combines intraabdominal and extraperitoneal methods. He opened the abdomen through the right rectus muscle for diagnostic purposes, and after exploring the pelvic ureteral region with the finger and discovering the exact location of the stone, he proceeded to attack it in the following manner:

On the outer side of the wound the peritoneum was stripped down to the ureter. The ureter was then dislodged and forced up by the finger within the abdominal cavity to a position in the extraperitoneal space, which allowed of an incision of the ureter

and extraction of the stone. The ureter was not brought into view; therefore, the operation was done by touch, suturing not being attempted. A strip of gauze was passed down and to the ureteral opening. The peritoneum was completely closed with catgut, and the other layers united, excepting at the lower angle of the wound, where the gauze made its exit. While recovery followed, leakage of urine continued for more than a month. Gibbon's method offers the same difficulty in suturing as do all extraperitoneal methods.

The only advantage which such a combined method possesses over the extraperitoneal methods is the opportunity afforded by the exploring finger within the abdominal cavity to locate the position of the stone and determine the existence or non-existence of pelvic complications. If complications are discovered, the abdominal wound must then be enlarged. Under these circumstances it offers an advantage in common with the intraabdominal method here advocated.

Though the removal of a stone with recovery may justly be considered a surgical triumph, success from the patient's standpoint depends entirely upon the relief of all symptoms. It is not uncommon, after correcting a given pathological condition, to find the ultimate result of the case unsatisfactory because of an associated disease left uncorrected.

It should, therefore, be our aim to adopt, when possible, such a method as will give opportunity for the correction of any and all pelvic lesions.

APPENDIX.

Since the completion of this article, there has appeared an article by Dr. Gerry R. Holden (*a*), in which the intraabdominal route is advocated when the calculus is situated in the broad ligament portion of the female ureter.

In the case he relates, however, the intraabdominal route was not adopted until after an unsuccessful effort was made to remove the calculus through the side incision.

His arguments in support of the intraabdominal route are practically those I have presented; but he limits its usefulness to that portion of the ureter situated at the base of the broad ligament. The case reported by me shows that this route is applicable to the removal of calculi situated practically in any part of the pelvic portion of the ureter. The removal of an ovary and tube in order to secure a better view, as advocated by him, is, in my opinion, an unnecessary sacrifice. In support of this position I would refer to my work on utero-vesical graft-

ing (*b*), when neither organ was sacrificed although the field of operation was at the base of the broad ligament between its surfaces.

The separation of the peritoneum by Dr. Holden, along the abdominal wall, from the field of ureteral work to the lower angle of the abdominal incision, can hardly be considered a necessary procedure, when ample provision for drainage had already been made retroperitoneally per vaginam.

John F. Erdman has, in a recent article, cited additional evidence in support of the view that ureteral calculus may be mistaken for a concretion in the appendix, and *vice versa*.

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5. Caldwell (quoted by Lillienthal). *Annals of Surgery*, vol. xl, p. 134.

6. Seelig (quoted by Lewis). *The Journal*, September, 1907, vol. xlix, p. 1103.

7. Lillienthal. *International Journal of Surgery*, November, 1906, vol. xix, pp. 67, 71.

8. Morris. *Surgical Diseases of the Kidney and Ureter*, vol. ii, p. 455.

9. Bovee. *Washington Medical Annals*, 1905, vol. iv, p. 233

10. Gibbon. *Annals of Surgery*, 1906, vol. xvii, p. 742.

265 WEST EIGHTY-FIRST STREET.

SOME OLD FALLACIES IN RETROVERSION SURGERY REVIVED.¹

BY

A. GOLDSPOHN, M. S., M. D.,
Chicago.

Professor of Gynecology at the Post-Graduate Medical School, and Senior Surgeon, Evangelical Deaconess's Hospital, Chicago.

THE last decade of the nineteenth century was a memorable period in gynecology for the large amount of rather riskful and experimental surgery for retroversion and retroversioflexion of the uterus. Ventrofixation, ventrosuspension, vesico- and vaginofixation, and notably the intraabdominal shortening of the round ligaments by the Mann and other forms of doubling them upon themselves, were all extensively tried and mostly discarded, either because some of them caused serious and unexpected obstructions to child-birth and numerous deaths from that cause, or because the uterine displacement recurred altogether too frequently, both before and particularly after intercurrent pregnancy and labor. The principal structure that was made use of as a means to an end in the surgical reconstruction, was the peritoneum. Its capacity for two continuously and firmly approximate surfaces to unite and its thinness and loose attachments which enable it to pull out and stretch to form bands, soon brought the peritoneum into this service. But it was soon discovered (what the writer called attention to eight years ago), that such supposedly sero-serous unions often became fibro-fibrous junctures or bands, because of the round cell infiltrations and connective-tissue formation which follow slight infections at the time of operating; so that serious barriers to parturition arose, sometimes after careful and considerate operating.

Again, owing to the variable and unknown degree of interference with the blood-supply of the parts by the sutures which hold them temporarily together, no operator can certainly determine by any suture material and sutures most carefully chosen and placed, how extensive a union or how strong a band he will develop nor how long it will hold. And, furthermore, what deals a death-blow to the peritoneum and all its foldings, plications and attachments, for the cure of uterine displacements permanently, is the fact that pregnancy during its long period

¹ Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

of gestation practically wipes out all these folds, plications and fixations, if they are really harmless and do not trespass upon its right-of-way, and the good of such surgery ends with the next following parturition. Accordingly, the evanescent nature of the cure of the displacement on the one hand, that resulted when a technic of operating upon these peritoneal structures was chosen, that would probably not cause obstructions to subsequent child-bearing and labor, and the numerous parturient disasters on the other hand, that followed when the surgical procedures upon the same structures aimed at greater certainty and permanence of the anatomical result, caused most careful workers in this field to look for some more harmless, effective and certain structures than the peritoneal parts, to utilize surgically for the cure of this common disorder. This they found in the round ligaments of the uterus. These structures being composed mostly of nonstriated muscular fiber, derived from the uterine walls, and blood-vessels, are a part of the uterus itself; and, as such, undergo with it its physiological metamorphoses incident to child-bearing—namely, evolution during gestation, and involution after labor.

Some years ago two Germans almost at the same time and independently made the discovery (pertinent to Cesarean sections), that the round ligaments grow evidently in every pregnancy, and can be felt at term when the abdominal wall is not too much loaded with fat and its muscles are relaxed, as structures approaching the size of a finger; and that from their upward course, whether more parallel or diverging from each other, it is possible to infer whether the placenta, in a mature case, is probably attached to the anterior or to the posterior side of the uterus respectively. The anatomical nature and physiologic capacity of these ligaments make them a really live and rather intelligent medium for the purposes here aimed at; in comparison with which all peritoneal attachments, plications and bands (so-called artificial ligaments) are dead things deserving recognition in the domain of pathology only, as kindred of other bands and adhesions produced by disease and not willfully by misguided surgeons. The unique and crowning feature of great value in the round ligaments is their capacity or nature to undergo involution with the uterus after labor. This supplies really the only possibility for a permanent cure of retroversion—one that will endure beyond subsequent child-birth, for all fixations and bands of a peritoneal or other source have no capacity to retract after labor.

What I have so far stated is rather generally known and accepted by most careful and intelligent men who have had any considerable experience in this direction. To them the round ligaments are the preferable medium of choice in dealing with these displacements, and the more recent question of how to use them has also been decided in favor of (firstly) some one of the numerous variety of transplantation of the round ligaments into the abdominal wall, when median ventral section is made, and (secondly) shortening of them via the inguinal canals, when complications are absent in the case and no other intraabdominal work is needed. So satisfactory are the results of these methods, in both of which the thick end of each ligament is brought into the principal service, that they will remain no doubt as standard. "The persistent backache" that Dr. Coffey charges these operations with, he alone seem to have found following them. Nevertheless, an elaborate article was presented before the Chicago Surgical Society some six months ago and later appeared in "Surgery, Gynecology and Obstetrics," entitled, "The Principals on which the Success of Surgical Treatment of Retrodisplacements of the Uterus Depends," by R. C. Coffey of Portland, Oregon.

The author's principal theme is, that the peritoneum is the chief and all-important structure from which the supports or ligaments are derived that hold the stomach, liver, intestines, spleen, and all the female generative organs in their places. By numerous good illustrations, he traces the embryological development of these supports, by uniting where they double upon themselves, while the endothelium is absorbed, *pari passu*, with the growth of the intestinal tube and the formation of its convolutions. The author concludes that because each viscus has a peritoneal mesentery that is capable of holding many times more than the weight of its respective organ without tearing; therefore, the mesentery is the chief support of each organ, including the uterus. This conclusion is doubtful because the numerous cases of enteroptosis and the like, in persons with relaxed and defective abdominal walls, indicate that the retentive function of the abdominal wall is probably of equal, if not of greater importance in preventing undue elongations of the various mesenteries.

Next, Dr Coffey states that he has by numerous animal experiments confirmed (what we have usually believed) that when two peritoneal surfaces are held continuously and firmly together as by interrupted sutures, they will unite and form one layer with

obliteration of the intervening endothelium, this scarcely any one will deny. But when he declares that the broad ligaments of the uterus, as a mesometrium, and especially their anterior blades, are the most important and natural thing to hold the uterus in its anteverted position, and that shortening of these blades by plication is the most rational and effective surgical method of cure for a retroversion, then we must protest that he is drawing an unwarranted conclusion from experiments upon the peritoneum of abdominal organs, none of which have similar functions nor undergo such changes as does the uterus. Furthermore, all good effects of his plication operation, upon the front blade of the broad ligament, will terminate when the next baby comes. There will be nothing left to prevent a return of displacement, if any tendency toward it should again rise, because a normal gestation eliminates such sero-serous unions that impede its way, by stretching, or otherwise, and being devoid of muscle or other elastic fiber, they certainly have no capacity to retract or recoup themselves afterward, any more than if no such operation had previously been performed on them.

Dr. Coffey omits child-bearing, the live part of this entire subject, from real consideration. He alludes to it in a casual way at the close when he says: "I have learned of a number of patients bearing children since operation. All were uncomplicated and, as far as I can learn, the uterus remained in position after labor," and he further adds that this is an important feature. But right here comes in the clincher in the whole matter, that vital evidence which decides the stand or the fall of any operation for retroversion of the uterus; and such evidence cannot be taken in random reports, guesswork, hearsay, or patients' opinions, nor can it be deduced from their subjective condition. Only actual, careful bimanual examination by the operator himself, or trained assistants, in each one of a large number of cases that have borne children after operation, can be accepted as competent evidence upon this vital point, namely, whether any given operation is not merely innocent of harm, to parturition—the *simple test of pregnancy*—but whether it is also really curative by securing the uterus in normal position quite uniformly in a larger number of such cases, *after one or more labors—the double test of pregnancy*. No operation for retroversion of the uterus, no matter how pretentious be its doubt, can be accepted as a normal or standard procedure until it has passed this double test. Child-bearing is the crucial testing feature that supplies about all the interest, impor-

tance and dignity that there is in the consideration of the surgical cure of uterine displacements; for in women who cannot conceive this disorder is of minor importance and it can be successfully treated in so many surgical ways that it is no longer a dignified subject for discussion. And, no more worthy or called for are articles on this subject, no matter how florid, that do not apply the above mentioned double test of pregnancy as the chief measure of their value.

It is high time that promoters of preferred operations in this line do less talking and writing and more real work in finding and examining their patients after they have borne children, and then reporting the findings without bias—a duty which so far, in our country, hardly any others than the Alexander operators have done. Dr. Coffey, in trying to carry out his primary idea of the importance of peritoneal derivatives as the chief supports of all abdominal and pelvic viscera, ascribes to the broad ligaments of the uterus the rôle of chief supports both in an upward and forward direction. He thinks that the anterior blade of these ligaments must hold the uterus in anteversion, that when it becomes relaxed the uterus falling backward as a dead weight upon the round ligaments tires these out and retroversion and descensus follows. He thinks that the most normal method of cure consists, therefore, in shortening the front blade of the broad ligaments by plication. This will no doubt suffice until the next child-birth, when gestation will have eliminated the operative shortening; whereas, if an efficient shortening of the round ligaments had been made—such as now is generally practised—these would have kept pace with the rest of the uterus in its metamorphoses, and would therefore continue afterward to poise the organ with a forward inclination.

Dr. Coffey admits that there are round ligaments, although objecting to the name ligament. He admits that they are composed, in the main, of uterine muscular fibers, are placed where such structures are needed and that they must not be permanently crippled, as they certainly have some material periodical function in guiding the body of the uterus forward, when overfilling of the bladder, or rectum, or dorsal recumbency would tend to throw it backward. This is about all that is usually claimed for them by any one. Nevertheless, Dr. Coffey says he thinks these structures have been “a stumbling block to many of our gynecologists.” Equally inconsistent and without proof are his statements that the round ligaments need but to be relieved of tension, and they

will then shorten or recover themselves; and second, that they work independently of the peritoneum, that when they are folded up by sutures, along with their enveloping peritoneum, they will pull out of their entanglement in the course of four or more months, when the sutures are absorbed, and leave the folded peritoneum united in the position first secured by the sutures.

Against the first of these assertions there arises a small army of women, to which I could contribute a small regiment, who have had their uteri held in anteversion, and the round ligaments slackened continuously by pessaries for years with revision by a doctor, at stated intervals each year, and a cure of displacement in only about one or two per cent. of all such cases resulted. The muscular round ligament bands, composed of nonstriated, involuntary muscle, for some reason do not retract when relieved of tension, as we see striated and voluntary muscle does, in orthopedic surgery. They can be depended upon to do this, only when involution is upon them and the uterus during the first months after labor. As to the other assertion, I would entertain much doubt, unless pregnancy and labor intervene. In three cases, years ago, where practically the same procedure upon the parts was done for retroversion, that Dr. Coffey advocates, and next a child was born, and then another operation for retroversion followed; every trace of the former operation had disappeared with the return of displacement after the labor.

Dr. Coffey says the round ligaments cannot endure constant tension. It remains for him to prove first that this is asked of them, naturally or artificially. Naturally, it is probable that they merely need to guide the fundus uteri forward, when it has been temporarily turned over backward, during dorsal recumbency, or by overfilling of the bladder and rectum. At other times intraabdominal pressure and gravity probably hold it in a forward inclination, especially during the erect posture, while the ligaments are idle. But if there be doubt in regard to this, doubt no longer exists as to the availability, efficiency, and transcending value, of these structures, as a means in the surgeon's hands, to cure the most prevalent infirmity among women, and to do it harmlessly and permanently. Three years ago, in my last report of the remote results of fifty cases of my bi-inguinal (extended Alexander,) operation, I made a collection of one hundred and sixty-eight cases, each of which had been examined, late enough after a child-birth that had followed an Alexander operation, in the hands of some one of twenty odd

operators. In this list of 168 cases (*Jour. Amer. Med. Assn.*, Nov. 18, 1905), there were only three recurrences of retroversion; and these were for cause—namely, cases of prolapsus that should not be treated by that method. In view of this mountain of most positive evidence in favor of the surgical value of the round ligaments, and of one of the accepted standard methods of using them, it behooves Dr. Coffey and all other promoters of diverse views and methods to spend enough time and money, as others have done, to find and to examine every one of their cases, as far as is at all possible, especially those who have borne children since operation, and then to report the findings in an unbiased, scientific manner, as evidence before the court of science. If they will each produce but a fraction of such a number of “double test” cases, as the above mentioned number with a similar small rate of failures, we will give them a respectful hearing; but mere theories and vagaries are as “sounding brass and tinkling cymbals,” and will not pass as evidence.

Finally, Dr. Coffey proposes to practice what, from his statement of the subject would impress any physician who is not familiar with the subject, as a new operation. But it is the identical bi-inguinal laparotomy or laparotomy by the Alexander route that I devised in 1893, and have performed over two hundred times, three times in Germany; that I have written about seven times; have reported the ultimate results of four times before national and international meetings, and still regard as the most nearly ideal operation for retroversion in fruitful women. But, since transplantation of round ligaments into the abdominal wall, via a median ventral incision, has been found to produce nearly as good results in curing the uterine displacement, and the median incision offered the great advantage of access to the vermiform appendix, and makes an exploration, at least, possible for all other vulnerable points in the abdomen, this method has nearly superseded the bi-inguinal route in my practice. Yet, that ship which I have built, Dr. Coffey proposes to appropriate and to sail in under his own colors. He has performed that operation only four times, as a convenient combination, in cases that had an inguinal hernia to be treated by the same incision. He likes it, as I do, and have done the same thing many times, with the best of results, and have reported such cases. But the morbid bias of Dr. Coffey in favor of his peritoneal theory appears when he ascribes the good results of all successful Alexander operations, to an

imagined shortening of the anterior blade of the broad ligament, incident to the traction upon the round ligaments, rather than to the shortening and anchoring, in a more forward direction, of the round ligaments themselves.

To be mentioned, to be discarded, is another futile procedure advocated by Dr. E. H. Ochsner, before the Chicago Medical Society, on April 15, 1908, with the following title: "The temporary Suspension of the Uterus. The Technic, Indications and Results." Ochsner advocates an Olshausen sero-serous fixation of the cornua, of the fundus uteri, with the parietal peritoneum at each side of the median incision, the idea being to hold the fundus forward, for a brief period, during which time the round ligaments are supposed to retract, and to serve in place of the defunct fixation. That this is an unwarranted deduction from orthopedic surgery I have already stated; and as he proposes this light fixation largely in cases where pus tubes and neoplasms have been removed and extensive raw surfaces exist, where infiltrations of the broad ligaments remain and pregnancy is out of the question, it is often impossible for the surgeon to separate the round ligaments and more so for nature itself. Durable, fibro-fibrous ventral fixations are there in order.

The conclusion of this whole matter is that we have learned nothing new, from these gentlemen, about the cure of retroversion of the uterus; that we have sat in judgment upon practically the same propositions many years ago, have weighed them well in the scales of experience, and found them seriously wanting.

34 WASHINGTON STREET.

REPAIR RATHER THAN REMOVAL OF THE GENERATIVE ORGANS OF WOMEN.¹

BY

JOHN EGERTON CANNADAY, M. D.,

Charleston, W. Va.

It has been well agreed that nature should have the first chance at many if not most cases of salpingitis, and in event of her failure the surgeon be called on to remove or correct, as far as possible, the offending pathology. In these cases the surgeon has either of the two or a combination of both conditions to treat: infection or the results of infection; the one he will treat by

¹ Read at the twenty-first annual meeting of the American Association of Obstetricians and Gynecologists, at Baltimore, September 22-24, 1908.

removal or by drainage—neither being ideal by any means. The other he can hope to correct and repair by plastic measures.

It has seemed practicable to me to divide cases of gonorrhœal pelvic infection into two classes, dependent somewhat on the social condition of the woman. The woman who can afford the time and money to lie abed for several weeks and to be a sort of semi-invalid for some time, afterward should have palliative measures and in a large percentage of cases will recover by virtue of her own powers of resistance and repair. If these fail she becomes a good subject for operation later and the results will be generally excellent.

If, on the other hand, the patient is poor and must get well and back to her work as soon as possible the case is not one for temporizing measures, and a prompt operation gives her a virtual assurance of being able to resume her work as a bread winner at an early day. She cannot afford to take so many chances of prolonged semi-invalidism and a late recovery, together with the added expense of treatment and the surroundings that would be necessary to make her life tolerable.

As soon as physiological resistance to infection has been well established, complete removal of the infected tubes brings speedy results. The nonoperative treatment of these cases, many statements to the contrary, notwithstanding, is in the main, judicious neglect. The numerous hot douches, tampons and other applications to the cervix and vaginal vault have as their real purpose the diversion of the patient.

At times the removal of an infected ovary will be necessary but, as a rule, resection at most for cystic disease will be all that is indicated. Retroverted, slightly prolapsed, congested, subinvolved uteri with their appendages, will after suspension, perineorrhaphy and rest usually approach their normal state. Chronic endocervicitis and endometritis can usually be cured by local applications to the interior associated with other corrective measures and do not as many would have us believe call for hysterectomy, an operation the results of which make more nervous our already neurotic women.

In the chronic catarrhal inflammatory conditions of the cervix we have as causative factors congestion from impaired circulation due to prolapse, to tumors, malpositions and other physical causes. Then added to this we often have a very old, very chronic infection. The physical causes must be corrected by suitable surgery and then the local infection can be attacked by

the local application, the cautery and the curette. Erosions due to cervical tears allowing the cervical mucosa to become everted may call for plastic procedures.

The presence of a few small fibroids in or on the uterus of a child-bearing woman are often best treated by myomectomy. The uterus can be easily explored by an anteroposterior incision bisecting this organ when submucous fibroids are suspected and their removal be easily accomplished. In dealing with cases of complete prolapse of the uterus there are several surgical measures which surpass in their effectiveness those operations of which hysterectomy is the principal part. Naturally, malignancy and tuberculosis call for removal of the completest sort.

COYLE AND RICHARDSON BUILDING.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of October 13.

The President, EDWIN B. CRAGIN, M. D., in the Chair.

URETERAL CALCULUS.

DR. H. J. BOLDT.—Some weeks ago a woman consulted me with a history that she had seen quite a number of physicians and various diagnoses had been made, varying from ovarian inflammation to gall-stone impaction. She had frequent micturition and intense pain in the lower part of the right iliac fossa. On examination the pelvic organs were found to be absolutely normal, but upon examining the ureter about one and one-half inches from the vesical terminus, I found a calculus.

The question arose whether she should be operated on. She was desirous of avoiding an operation, so I ordered her to come back to my office the next day when I endeavored with a ureteral catheter to dislodge the calculus. To this was added manipulating the ureter at the site of the calculus between my internal and external hand. I also requested her to drink large quantities of water, and about forty-eight hours afterward she brought the calculus to me, which was passed within a day after his consultation. The case is interesting because the diagnosis was made only by palpation.

Another case I saw of a medical colleague of mine, where the diagnosis had been made by *x*-rays. He thought some surgery should be done, but on the advice of Dr. Bissell and myself he waited about three or four days, after which he also passed the calculus and showed it to us.

DR. VINEBERG.—As a feature in the discussion I might mention a case I had during the summer. A young woman, rather

stout, in her second pregnancy, between the fifth and sixth month, was seized with a severe pain in the right lumbar region. She had a good deal of sickness and vomiting. The picture of the case to my mind was one of pyelitis of pregnancy. She had some intestinal disturbance before, and this severe pain coming on the right side, with a chill, almost made the definite diagnosis of pyelitis of pregnancy, but one thing was not present. There was no temperature. This remained normal. The pain subsided with a hypodermic of morphine, and then the nurse noticed a couple of days later she was passing blood with her urine, and I was not very long then in coming to the conclusion that we had to do with a ureteral calculus. The pain was acute, recurring about once in twenty-four hours, and was not along the course of the ureter definitely, but along the back and toward the hips. I was anxious, of course, to make a positive diagnosis as to the presence of the calculus, and had the patient *x*-rayed by Dr. Caldwell. At that time I was a little bit afraid of subjecting the fetus to the *x*-ray, but on thinking the matter over and knowing that other men had experience which did not seem to indicate much danger in exposing the fetus to a short exposure, I decided to attempt it. Dr. Caldwell was afraid he would not be able to get a good picture, owing to the local conditions, but a very satisfactory picture was obtained showing the stone, he said, about two inches from the entrance of the ureter into the bladder.

The question came up what course to pursue. I personally was very much in favor of conservative action, but the family were impatient, they kept urging me for an operation. Finally I consented to consultation with a surgeon, who, fortunately, was also conservative in this matter, and we agreed to wait and see what would happen. I had her come to my office, placed her in the knee-chest posture, and passed a ureteral catheter up by the side of the calculus. I did not know whether I would dislodge it, but within twenty-four hours she had a severe attack of pain and passed a calculus about the size of a pea. She went on to full term and had a normal delivery.

DR. BROTHERS.—I had an experience some years ago which fits in with the experience referred to to-night, in a woman who had a violent attack of renal colic. The diagnosis was perfectly clear and the symptoms characteristic. I put her on the usual treatment and advised her to watch the urine very carefully for the passage of a stone. After the attack subsided, she watched her urine very carefully for forty-eight hours. Nothing was passed. She then came to my office; I examined her with the Nitze electric cystoscope expecting to find the calculus in the bladder. To my surprise I found the calculus lodged in the mouth of the left ureteral orifice. She had no symptoms of hydronephrosis due to complete obstruction of the ureter, and the urine seemed to trickle by the calculus. I had no instrument at hand for its removal at the time, and started to get an approx-

priate forceps; I told her to come again in forty-eight hours. She returned at the end of that time with the stone. I have it yet. It was not any larger than in the previous case referred to by Dr. Viueberg—perhaps about the size of a pea. I shall bring it to the next meeting, as I think it will add to the interest of this discussion.

DR. EDWIN B. CRAGIN.—The Chair would relate an experience not quite so fortunate in the fact that the woman had to be subjected to an operation before she was able to pass her calculus. She had had it a considerable time and suffered a good deal from it. You could make it out by palpation on the left side about an inch from the entrance of the ureter into the bladder. After trying to dislodge it with the ureteral catheter, I made an incision above Poupart's ligament, reaching the ureter extraperitoneally, expecting to incise the ureter and take the calculus out. After getting the ureter in my fingers and feeling the calculus to see if it was movable, it suddenly disappeared and evidently slipped into the bladder. I did not open the ureter and she passed the stone the next day. The recovery was good, but if she had been able to pass it without the incision I should have been glad.

I think we must recognize that patients will frequently pass these calculi without operation. Sometimes, however, they will lodge just above the bladder and cause marked distress. While I think the thing to do is to try to dilate the ureter by means of the ureteral catheter, with the hope that the calculus will pass, in some cases operation is necessary, and then I believe the best incision is to go extraperitoneally and strip back the peritoneum until the ureter is reached, then open it longitudinally. A number of men have tried it through the vagina and some successfully, yet the risk of a uretero-vaginal fistula seems to be so great that I believe the extraperitoneal route is preferable. In most cases the ureter in these extraperitoneal operations heals without much difficulty.

Papers were read by DR. EDGAR on

THE TREATMENT OF POSTPARTUM HEMORRHAGE.*

and by DR. BRODHEAD on

THE TREATMENT OF ACCIDENTAL HEMORRHAGE AND PLACENTA PREVIA.†

DISCUSSION OF DR. EDGAR'S AND DR. BRODHEAD'S PAPERS.

DR. JEWETT.—I have had one or two cases of accidental hemorrhage with a rigid and undilated cervix in which I thought I might have done better with Cesarean section. That operation has a better application here than in placenta prævia, yet a woman who has lost much blood is very rarely in condition to stand a major operation.

In placenta prævia if the woman has bled much she is not a

*See original article, page 944.

†See original article, page 950.

case for Cesarean section. The usual obstetric methods almost invariably are better.

I am glad to indorse the writer's views of the need of conservatism in these cases. Too active interference is responsible for many deaths in placenta previa. Hemorrhage under control, we can be content to wait. Adding a little shock to much hemorrhage may precipitate the end when it is least expected.

In placenta previa with hemorrhage through an undilated cervix, Dr. Heman, of London, has used the vaginal tamponade extensively with good results. A cervical tamponade, I think, especially the Pomeroy bag, is better. The vaginal pack soon becomes foul.

DR. EDGAR has alluded to the danger of air embolism in passing the hand into the uterus in postpartum hemorrhage. Drs. Hare and Thornton, some years ago, in an elaborate study of the subject, threw a good deal of doubt on air embolism as a cause of death.

DR. JARMAN.—I can only say that there is one thing Dr. Edgar has not mentioned. I do not know whether he is acquainted with the use of it or not. I carry in my obstetric outfit always a bottle of tincture of iodine just the same as I carry any of the rest of the contents. Personally, I have to resort only to the very hot irrigation to control hemorrhage in a relaxed uterus. I make the solution about a light wine color, usually very hot, and I have had no occasion to regret using it or change that solution for anything else. Undoubtedly the hot acidulated water will have the same effect, but, personally, I carry this little bottle of tincture of iodine with me all the time. It has always acted perfectly in controlling hemorrhage in these cases coming on from a relaxed uterus.

DR. HAROLD A. MILLER (of Pittsburgh).—It is a matter of extreme regret to me that my train was late and I did not hear Dr. Brodhead's paper in full. What I was hoping to hear, however, was the expression of the Society on the ligation of the uterine artery for the control of hemorrhage in cases of placenta previa centralis. It is to be remembered that the uterus receives its blood supply from the uterine and ovarian arteries, both being about the same size in the nonpregnant uterus, but in pregnancy the uterine artery increases very rapidly and very early and as is brought forth in one of our early symptoms of pregnancy we can palpate the artery almost as soon as we are able to demonstrate any of the signs of pregnancy. In placenta prævia centralis it is my contention that this artery is very much larger, and a greater quantity of the placental blood-supply passes through it than when the placenta is located as it normally should be in or near the fundus of the uterus.

I wish to personally mention several objections which have been brought against the ligation of the uterine artery. One is that it would cause an increase of infantile mortality. When we consider that in nearly all of these cases the hemorrhage

begins at the end of the sixth or the beginning of the seventh month and that in the most approved older methods about 64 per cent. of the children were born dead and that considerably over one half of those born alive died before the end of the first year, so that in every method the infantile mortality is high and the percentage of infants living at the end of the first year is not more than 22.

In only four of the fourteen cases which came to me were there any evidence of fetal life at the beginning of the delivery. Three of these infants were born alive, but all died of prematurity within the first twenty-four or forty-eight hours. The first case in which I used this method was on the wife of a physician who came to the hospital after rather prolonged bleeding, anemic, pale, pulse about 120. Examinations had been made previous to her admission and on account of the extreme degree of anemia I was anxious to deliver her as rapidly as possible and conserve as far as possible the loss of blood. The uterine arteries on either side were tied, uterus dilated by means of the Bossi dilator; but my previous experience had led me to be very much alarmed for fear of hemorrhage in cases of this kind, so that after dilatation was secured a version was done and the child brought down into the cervical canal and rather rapidly delivered. In this instance there was quite a deep cervical tear. The second and third cases were cases that bled three to four days before coming to the clinic and they were in such condition that they certainly would have died within a few hours, even though no attempt had been made to deliver them.

The artery was tied and we proceeded to deliver, which was done rapidly and without any especial injury. The cases, in my own opinion and the opinion of several of my professional brethren who witnessed the delivery, lost less blood than they ordinarily do in normal deliveries. This loss of blood was probably influenced to a certain extent by the extreme degree of anemia, as well as the ligation of the arteries and at that time I did not have sufficient confidence in the ability of the ligature to control the hemorrhage and wait until the anemia had been successfully combated by an intravenous saline. Following this I have delivered eleven consecutive cases by this method and without mortality, the majority of them having occurred in the hospital, but some of them outside. In the first cases in which the uterine artery was ligated the ligature was removed after delivery; but in the fourth case there was a well-marked postpartum hemorrhage immediately after the cutting of the ligature, and in the cases subsequent to this the catgut ligature used to surround the artery was allowed to remain, and in no instance did I have to contend with postpartum hemorrhage. I believe this is not an unimportant part of the advantage of this method as there is normally a paralysis at the placental site and this paralysis is very much exaggerated when the placenta is located below Bandl's contraction ring.

That this does not permanently interfere with any function of the uterus is shown by the fact that in one instance a living child has since been born and in several of them where I was able to trace them the uterus seems to be in a perfectly normal condition and well supplied with blood.

It is not my contention that the tying of this artery can be done by men entirely unfamiliar with the anatomy of these parts, but this fact is not a valid objection, as even the primary condition is a most serious matter when in the hands of any except skilled obstetricians. In the hands of men who are acquainted with the anatomy of these parts, I believe that it is an operation which can be done with comparatively little danger of including the ureter. If in rare instances the ureter be included in the ligature it would probably be discovered in the course of a few hours, and at that time the ligature could still be removed and have done no harm.

This method immediately controls the bleeding in all these cases and permits of our leisurely perfecting our technic, and I believe that collateral circulation would not be established until after sufficient time had elapsed for us to have instituted such measures as intravenous injection of normal saline, and in cases where the hemorrhage has been severe I would recommend waiting until the pulse and the patient's general condition had improved. Just how long it would be safe to wait I have not as yet been able to determine, but the collateral circulation would no doubt be established rather slowly, and even after oozing was noticed the ligatures around the uterine artery would no doubt very materially assist in controlling excessive hemorrhage.

As Dr. Jarmen brought out in his discussion of these cases, many of them no doubt die on account of the obstetric shock, but the simple ligation of this artery does not in any way increase the shock and does permit of more leisurely dilating the os, thereby preventing surgical tears and greatly lessening the shock, while on the other hand the temptation to rapidly dilate and deliver in the face of severe hemorrhage is such that no obstetrician would leisurely dilate the os and deliver slowly in the face of continuous and dangerous hemorrhage.

I would be very much interested in hearing this matter thoroughly discussed, as it is a procedure that is either very good or very bad. If it is very bad I am anxious to know it and discontinue its practice.

DR. ———.—I would like to ask the doctor what his technic is. Does he make a vaginal incision and pass the needle under it, or does he pass the needle from above? With reference to the ligature, does he think it necessary to remove this? Some of us have tied these arteries in cancer without any bad effects.

DR. MILLER.—In answer as to the technic I did not go into that, believing that perhaps it was familiar to you all, as it has been previously published, but I believe the proper way to do it is after careful preparation of the parts to grasp the cervix with a

tenaculum forcep. If you are tying the right artery use the index-finger of the right hand to palpate the artery and *vice versa*, using the hand corresponding to the side upon which the artery is situated and then with the other hand pass the ligature from below up. I have heard several discussions of it, especially with regard to tying of the ureter. We find that the ureter in full-term, pregnant women is very much farther away from the artery than it is in non-pregnant women. If you pass your needle from below up there is very little danger of catching it. The ligating to be effective must be just above the point where it divides into anterior and posterior cervical arteries. For the opposite side we reverse the procedure, using the left hand to hold the needle and pass it again from below up. I have been using catgut for this ligature as I have allowed it to remain on account of the frequency of profuse postpartum hemorrhage and in these cases even slight postpartum hemorrhage is of serious consequence.

DR. CRAGIN.—Does the Chair understand that it is done without an anesthetic?

DR. MILLER.—It can be done without an anesthetic. It is not particularly painful. But I prefer an anesthetic in cases where the anesthetic itself will not have an unfavorable influence upon the patient's welfare. Under these circumstances it will enable you to keep the patient quiet, and the ligation can be done more readily and speedily.

DR. EDGAR.—Do you use a sharp needle or an aneurism needle?

DR. MILLER.—I use a sharp needle, but I believe that the suggestion of an aneurism needle is a very good one as the cervix at this time is sufficiently softened to allow a needle of this character to be readily passed.

DR. MABBOT.—Is the needle passed from below upward to avoid the ureter, and if so, is it not much more difficult to pass it from below up?

DR. MILLER.—It is passed from below upward to avoid the ureter. I presume it is the more difficult way, but as I am ambidextrous I can handle the needle almost as well with my left hand as with my right.

DR. VINEBERG.—I would like to ask Dr. Miller if he considers this technic indicated only in complete placenta previa, and in that case, whether it is possible to make the diagnosis of complete placenta previa without pretty thorough dilatation of the cervix? At least it appears to me so, that it is not possible to make a diagnosis of the extent and the position of the placenta without dilatation of the cervix, and if in that case he does not find it difficult to place his ligatures with the head pretty well down and the cervix stretched, leaving but a narrow space between the rim of the cervix and pelvic wall.

DR. MILLER.—In answer to Dr. Vineberg's question, regarding the differential diagnosis between placenta previa centralis and the marginal type, I think it is important to make note of the

time when the patient begins to bleed, as in placenta previa centralis the hemorrhage usually begins much earlier than it does in lateral cases. In other words, placenta previa centralis very rarely goes to term, and for that reason most of the cases that occur at the end of the sixth or the beginning of the seventh month can be considered as probably of that character. There is also another method that is of value in making our diagnosis; that is, in our examination of the lower uterine segment it is quite frequently possible for us to palpate the margin of the placenta through the lower uterine segment, as has been pointed out; occasionally the margin can be palpated through the anterior abdominal wall, although in my personal experience this has occurred but once. We must admit, however, that there are times when it is extremely difficult to distinguish between placenta previa centralis and the marginal or lateral type, and in one case of this character I tied the artery, although it is not included in my series.

I have been very anxious to find a means of permanently marking the part of the placenta which was immediately within the os. Injections of paraffine and different colored solutions have been tried, but all found more or less unsatisfactory.

DR. BRICKNER.—I would like to ask Dr. Miller if he would resort to this operation instead of immediate delivery at any time during pregnancy when he is convinced that there is placenta previa centralis, or if he uses it after the first hemorrhage?

DR. MILLER.—In answer to that I would state that in every instance the cases were bleeding when I first saw them; only one of the cases occurred in my own individual practice and at that time I was in a distant city reading a paper and it was some five or six hours before I saw the case. The other cases have all been seen in consultation and all had been bleeding some time before I saw them. I do not know just what I would do if I were to see a case of placenta previa centralis and there had been no hemorrhage. If it were to occur in my own family I would deliver at once. In other cases I believe it would be well to explain the great danger which existed as long as the products of conception were retained and the small probability of securing a living infant, allowing the patient to select what she considered the lesser of the two evils. My own feeling leans toward immediate delivery.

DR. EWALD.—In regard to placenta previa, experience has given sufficient proof that of all the methods the conservative delivery is still the best; the slightest tear of the cervix can cause a violent bleeding too often followed by a fatal result. I have experienced it in one case where I tried to save the living child, even the stitch-holes of a thin needle bled severely.

So far as Dr. Miller's method is concerned, I must say a similar method was tried and consequently proposed by Braun von Fernwald in 1893 in cases of postpartum bleeding; it proved not to be successful and practical and therefore was not accepted by obstetricians.

Dr. Henkel, of Berlin, has used a method in recent years which, according to his reports, is able to check bleeding in severe cases, although he must admit that lesion of the ureter and bladder can easily occur. He recommends to grasp the uterine artery close to the uterus by forceps and let the same remain for twenty-four hours.

I call your attention to one type of bleeding which I have seen in one case. There was no lesion, the uterus was well contracted and still the patient kept on bleeding till death ensued; in this case the blood did not coagulate, and, in my opinion, the absence of the so-called fibrinogen substance was the cause of the accident; there was no history of hemophilia.

DR. MABBOTT.—In discussion of Dr. Brodhead's paper, I wish to state that I was once present at a meeting of the West End Medical Society when my late friend, Dr. Tucker, discussed the same question and in relation to the cases to which Dr. Miller's operation does not apply, namely, marginal placenta previa, Dr. Tucker made the most dogmatic statement in regard to the treatment that I ever heard made on any subject. He had served on the house staff of the Nursery and Child's Hospital; he had spent a year abroad, which included work in Vienna and Paris; he had completed a very long service at the Sloan Maternity Hospital—I think five years' residence—and his statement was this (he repeated it three or four times): "In cases of marginal placenta previa, rupture the membranes; that is all you have to do!" That is the way he put it. "Rupture the membranes; that is all you have to do." Then he talked about the treatment of the patient constitutionally according to the amount of exsanguination, and possibly helping the patient to terminate her labor; but so far as the danger of hemorrhage was concerned, I think I am right in quoting him as feeling absolutely sure in his own mind that any other local measures were absolutely unnecessary. He depended upon that procedure.

DR. VINEBERG.—I would like to say a word about this. I see at least three or four cases a year of placenta previa; although my experience is not extensive, I must say that these cases do not give me any great dread. The diagnosis has already been made by the attendant. I do a dilatation with the hand as soon as I get the patient washed up. I do not take my hand out until I can put my fist in; finally if the placenta is in the way, I push it to one side, do a version, and these cases were invariably done well. I do not know of any case that has died. I am rather, surprised, therefore, that such a procedure should be deemed necessary so often as Dr. Miller's statistics would indicate. Also I am somewhat surprised that Dr. Brodhead considers it necessary to pack the uterus with gauze in every case. I have probably had thirty or forty cases in all during the past ten years and have never packed the uterus once. The uterus contracts unusually well after the fetus and the placenta are delivered, and I know of no case—and I have kept in connection with the

physician afterward—in which there was any hemorrhage afterward. I must say that in only a certain class of cases where placenta previa centralis is diagnosed the procedure of Dr. Miller's might be of value.

DR. EDGAR.—Dr. Vineberg has referred to packing the uterus after delivery in placenta previa. For a number of years I was very much opposed to putting gauze into the uterus in these cases, but it has got so now that it is practically a routine with us. It is just a matter of experience. We found in the hospital cases after they were sent down to the ward they kept on oozing, so it got to be a routine, whether they were bleeding or not, to pack the uterus with gauze, and it was a prophylactic in a way, as our results were much better with the packing.

Here is an instance: Last Friday I had a placenta previa, a private case, in the hospital, and prompt delivery was called for, as she was bleeding too freely. I had promised to take a train at a certain hour, and I understood the resident physician would pack the uterus. I delivered the case by version and hastened to catch the train. The uterus was not packed and later she had a severe little hemorrhage and had to be packed subsequently.

DR. BRODHEAD.—We agree with Dr. Edgar that the use of ergot after labor is a very important one. Some years ago I did not give it, as a rule, but my routine now is to give it in every case. There is no valid reason why it should not be done, and I think there are good reasons why ergot should be given. I think, too, that in the absence of hemorrhage, twenty to thirty minutes is about the proper duration of the third stage.

It has been my experience that secondary hemorrhage is very unusual if primary hemorrhage has been checked. In other words, if the patient at the end of the obstetric hour ceases to bleed, it is very unlikely that she will bleed again.

I was very much interested in what Dr. Miller had to say. I have had no experience with his method, but it is a most interesting technic, well brought out.

† In regard to the treatment of marginal placenta previa by rupture of the membranes, I do not at the moment remember to have seen any cases treated only by that method, for it is my impression that Dr. Tucker at the Sloane Maternity usually performed version.

With regard to postpartum packing, it has been my experience that in placenta previa there is a paralysis of the placental site, and that a good many of these cases have already bled a good deal before they are delivered. I think it is very wise, therefore, to put these women in the best condition and guard against further hemorrhage by a firm tampon.

THE PRESIDENT.—There is one thing suggested by these remarks that it may be of advantage to call attention to, and that is, it has been my experience, and I presume of most men who do obstetrics, occasionally to meet with a case in which the uterine

tamponade will not check postpartum hemorrhage. Some have bled so much and their tone is apparently so reduced that no matter how firmly you pack the uterus, and I believe it is possible to pack it too firmly, the uterus will go on bleeding above and into our tampon, and bleed in spite of everything we can do. Those are the cases I am sure annoy us all. The accidental hemorrhage cases where the woman is in poor condition, in the first place; when the cervix is rigid and the uterus balloons up with blood—these are the cases in which tamponade of the uterus after the delivery sometimes brings us great disappointment. We tampon the case and she bleeds in spite of it. I want to call attention to this as one of the unfortunate experiences which I have met, and I presume other men meet with the same.

DR. CRAGIN.—My remarks referred to tamponade of the uterus after it was emptied—to cases which bled in spite of all we could do.

DR. EDGAR.—In the early nineties Dr. Frank Ferguson did an autopsy at which I was present, and I remember he said the diagnosis was air in the vessels in that case. I think everything had been done for that woman in the way of intrauterine treatment. It was a hospital case. In another instance a woman came into the hospital and she acted in the same way as the other woman did, and the cause was attributed to air embolism.

I do not know why iodine is not just as good as acetic acid. In the early days we started to use acetic acid and since then every maternity bag contains two ounces of acetic acid. I presume its simplicity and the color of the acid, as well as the certain results, have made it popular. The tincture of iodine tends to make a clot. I never saw acetic acid form a clot of any size; sometimes iodine does. This is the only difference I can see.

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

(Continued from November.)

DR. GEORGE W. CRILE, of Cleveland, Ohio, read a paper entitled

A HEMOLYTIC TEST FOR MALIGNANT TUMORS.¹

DISCUSSION.

DR. ROLAND E. SKEEL, of Cleveland, Ohio, was familiar with the work that had been done by Dr. Crile, and congratulated him and the Association on the technical physiological knowledge displayed in doing this work. It showed how important was

¹ See original article, page 933.

the physiological in contradistinction to the anatomical surgeon; that while other members might be able to do this work, it was only those with physiological training who were able to get down to the fundamental facts in pathology.

There were two important possibilities which might develop from the work of Dr. Crile. *First*, while the essayist disclaimed any positive diagnostic reliability for his test, at the same time the very fact that 84 per cent. of the early malignant cases showed hemolysis gave as reliable evidence as any of the laboratory tests of the present day, if not more so, and it was evident that while laboratory work might not give positive facts, it might in many instances become one of the most important factors in making a diagnosis. Working along this line, he thought there were infinite possibilities in the way of demonstrating the etiology and chemical pathology of malignant growths.

DR. MILES F. PORTER, of Fort Wayne, asked Dr. Crile whether any of these experiments were carried out on lower animals.

DR. CRILE replied that he had not tried the tests on lower animals, but the suggestion was well worthy of consideration.

September 24—Third Day.

DR. ROLAND E. SKEEL, of Cleveland, Oho, read a paper
INJURIES TO THE BLADDER OCCURRING DURING HERNIA
OPERATIONS.¹

DISCUSSION.

DR. JOSEPH H. BRANHAM, of Baltimore, said there were undoubtedly a great many cases of hernia of the bladder that had not been detected during operation, the patients dying afterward, and their cases were not reported. A large proportion of such cases did not get into the literature. On the other hand, a great many cases that were operated on successfully were not reported. He had been negligent in this respect himself. He had encountered two such cases in his practice. In these two cases, in operating slowly, finding what looked like an extra sac closely adherent toward the inner side of the hernia, he succeeded in passing a grooved catheter into the bladder and around into the hernial sac. This method of recognizing a hernia of the bladder was very much superior to the use of methylene blue.

DR. W. N. SPRAGUE, of Washington, D. C., (by invitation) some twelve years ago had such a case, in which he made use of the ordinary uterine probe with which to determine the presence of a hernia, and was able to demonstrate it easily. When he got down to the hernial sac, there was a thickening of the median side, and he suspected it might be a hernia of the bladder, which it was, the first one he had ever seen. Since then in every suspected case he had used the uterine probe with which

¹ See original article, page 964.

to explore the bladder at that point, but had not encountered a second case of hernia of the bladder

DR. HUGO O. PANTZER, of Indianapolis, said a recent observation pertained to this subject. A general surgeon operated upon a spare individual having a femoral hernia, with very slight protrusion, but very adherent sac. This operation was followed by the speaker with an abdominal operation. When he opened the abdomen he found the peritoneum of the entire right half of the pelvis denuded. In other words, there had been an inordinate pulling out of peritoneum for the purpose of high suturing. The surgeon drew upon the peritoneum of that half of the pelvis to the extent of bringing it out into the wound, and then afterward the suture under high strain slipped, and there was a large denuded surface. He was confident that the frequency of hernial protrusion was in large part due to the effort to strike the peritoneum at a high point. As long as only the ordinary withdrawal of the peritoneum was done, these patients would have hernia less frequently.

DR. ALBERT GOLDSPOHN, of Chicago, said that in two instances of inguinal hernia in the male a suspicious pouch appeared in the wound which was proven by the introduction of the male sound to be the bladder. After this recognition it was successfully guarded against injury. In one instance he resorted to bi-inguinal shortening of the round ligaments, the operation having been done for a complicated, severely adherent retroverted uterus by the bi-inguinal route, breaking up adhesions with the finger through the inguinal canal, doing some resection of the appendages, then shortening the round ligament by drawing it more directly forward, and anchoring to the posterior surface of Poupart's ligament. On one side the patient had leakage from the wound the next day. This was not serious, nor did it lead to any evil consequences, and ceased within a week.

DR. GEORGE W. CRILE, of Cleveland, stated that in over four hundred operations for hernia he and his associate had seen but five cases of bladder hernia. In one case, a little girl, nine years of age, there was a femoral hernia. The child had been operated on previously by someone else, and she was brought to him on account of recurrence from the first operation. He operated, sutured the bladder, and the child recovered.

In another case the bladder was accidentally opened. He immediately sutured it satisfactorily. He had had five cases of bladder hernia, two of which were recognized at the time, and in both instances the bladder was sutured, and the patients did not have any discomfort afterward.

DR. ROBERT T. MORRIS, of New York, had opened the bladder twice, once in removing fibroids, and once in a case of ovarian cyst, and in both of these cases by introducing a catheter into the urethra there was a subsequent flow of urine in the line of least resistance, and no complication resulted.

DR. WALTER C. G. KIRCHNER, of St. Louis, said that in the City Hospital at St. Louis they had a great number of cases of hernia, but he had only encountered one instance of hernia of the bladder. In this particular case there were three rings. The larger was in the position of what would usually be represented by a direct hernia. The outer one corresponded to the internal femoral ring, and there was a small compartment in between. The larger and inner one contained the bladder. This he did not recognize until the bladder was opened. A catheter was passed into the bladder and it was found that the bladder extended on the left side to within two inches of the crest of the ilium. This hernia had existed for some time, and the ring being large the greater part of the bladder was drawn to that side. The bladder was repaired; the true hernia also attended to, and the wall strengthened. A complete and satisfactory recovery was obtained.

DR. SKEEL, in closing the discussion, fully agreed with the speakers that in a true hernia of the bladder there was no difficulty in making the diagnosis by passing a sound into the bladder. Also in true bladder hernia there should be practically no difficulty in making a diagnosis before operation. The point he endeavored to make was that the greater number of all so-called bladder hernias were artificially produced during operation by traction on the neck of the sac in ligating the sac high up.

DR. JOHN YOUNG BROWN and DR. WILLIAM ENGELBACH, of St. Louis, read a joint paper entitled

GASTRIC TETANY; OPERATION; RECOVERY.¹

DISCUSSION.

DR. JOHN F. ERDMANN, of New York City, reported a case that occurred in his practice. The patient was a child, 5½ years of age. He was called to see the child on a Saturday at half-past eight. The history given was that the day previous the child had eaten a small portion of rice and fresh fish. Following this there was an attack of vomiting with convulsions. Toward evening the convulsions became almost continuous. The previous history was that for a period of three years the child had manifested symptoms of tetany and had convulsions of greater or less degree, and was taken to foreign countries for treatment, but with no further suggestions than care as to the dietary. He was called by Dr. LaFetra for the purpose of opening the abdomen for an intussusception or intestinal obstruction. In examining the child he found that the trouble was not due to intestinal obstruction, but found an area of dulness on percussion which extended over the entire left half of the abdomen, the dulness extending to Poupart's ligament, passing over the median line, going up close to the umbilicus, with an area of tympany superimposed upon that which extended to the

¹ See original article, page 970.

epigastric space. The child had been chloroformed two and a half hours previous to his visit as the result of the condition it was in from spasms; a catheter was passed through the nose, through which a large quantity of fluid was withdrawn with a considerable amount of gas. Within a period of twenty minutes, after washing out the stomach, the previous area of dullness and tenderness was practically normal. The child recovered from this attack. As to subsequent procedures, he could not state. The child developed pneumonia and empyema subsequently, passed into the hands of a surgeon for the removal of a rib, but he understood there were no further attacks up to within a period of six months from the time he saw the child. The speaker was satisfied from the clear exposition given by Dr. Brown that this child suffered from gastric tetany due to gastric dilatation, but from what cause he did not know.

DR. JOHN D. S. DAVIS, of Birmingham, Alabama, read a paper entitled

TREATMENT OF TYPHOID PERFORATIONS.¹

DISCUSSION.

DR. THOMAS B. NOBLE, of Indianapolis, said he knew of no condition confronting the surgeon which demanded of him greater certainty in diagnosis than the question of perforation from typhoid fever, and anything which would render help in diagnosis, treatment, and prognosis, was to be welcomed. He called attention to the advantages of auscultation. He had been able to settle for himself the existence of a perforation in one case by such a means and the sound was elicited in this wise: he used an ampliphone, placing it over the area of greatest tenderness, and by making alternate palpation on either side he was able to elicit a friction sound such as one would get in a pleuritis. The same sound was produced by deep respiratory movements, which indicated roughened peritoneal surfaces passing over each other, the roughening due to an infection which came from an impending or already existing perforation. He had since demonstrated this sound or symptom in other areas in the abdomen in which he suspected a focal or regional peritonitis due to an analogous pathology.

He agreed with the essayist in saying that the prognosis depended on the time one operated after perforation had taken place, and the earlier the operation, the better for the patient, even though it be done at the time of shock. A perforation occurring at the end of the first week or during the second or early part of the third week gave an infinitely better prognosis than a perforation occurring after six or seven weeks of a prostrating illness.

DR. MILES F. PORTER, of Fort Wayne, Indiana, emphasized what was said regarding the advisability of operating in the presence of shock, and he would extend that advice to the vast

¹ See original article, page 982.

majority of surgical conditions requiring operation, including traumatism. His own candid opinion was that to wait for shock to subside was to add the probability of a serious result. He emphasized, too, the advisability of operating not only in these cases, but in some without an exact diagnosis and for the purpose of making an exact diagnosis. The only diagnosis necessary in a case of this kind was that of a circumscribed peritonitis. It did not make a bit of difference whether a perforation had already occurred, or whether it was about to occur, so far as the necessity for operation was concerned. These ulcerated areas oftentimes leaked and caused peritonitis before actual macroscopic perforation had occurred.

He cited a case which was under his observation at present which illustrated a number of points in connection with this subject, particularly as to diagnosis, prognosis and treatment.

DR. HERMAN E. HAYD, of Buffalo, asked the essayist whether, in view of the fact that he had mentioned in his cases a number of multiple perforations, it would not be advisable, in order to make a satisfactory exploration, to go over the whole bowel. Of course, it was known that perforation in the great majority of cases occurred in the region of the ileocecal valve, and if one were to content himself with that thought he probably would not extend his investigation to exploring the ascending and transverse colon, and if this were not done he would surely overlook some of the perforations, and therefore he desired to ask Dr. Davis whether in any case he might be called upon to operate on he would extend that exploration to the whole bowel, or to at least the duodenum and perhaps to the descending colon?

DR. WILLIAM A. B. SELLMAN, of Baltimore, said that the sooner patients with perforation from typhoid fever were operated on, the brighter the prospect of saving their lives. He always instructed the interne to look out for shock in these cases, and sudden depression, and whenever this occurred, to notify him at once. These cases were allowed to go on for hours or perhaps days, and develop sepsis, when the prognosis was extremely unfavorable. It was early operation that saved the lives of many of these patients, when the opening was small, and when a small amount of the contents of the bowel had exuded into the peritoneal cavity.

DR. JOHN E. CANNADAY, of Charleston, W. Va., said that many of these cases were eminently suited to the use of local anesthesia. Some of them were either delirious or semidelirious on account of being loaded with the typhoid toxins, and their sensibility to pain was pretty well obtunded, and if one injected into the abdominal wall weak solutions of betaeucaine, novocaine, or cocaine, which was more toxic, the patient would bear the operation well. One could make an incision of moderate length and if he did not strike the right place in searching for the perforation, he could easily repair the damage with a mini-

num amount of shock to the patient, the patient escaping the shock of the anesthetic and its toxic effects.

DR. DAVIS, in closing the discussion, said that auscultation as a method of making a diagnosis in these cases was imperfect and unreliable. He had frequently demonstrated the unreliability of auscultation in gunshot wounds, particularly upon dogs. Perhaps in only one case out of twenty-five would one get the sound referred to by Dr. Noble, but it was valuable when it could be elicited.

He concurred with Dr. Porter in regard to exploration as a means of diagnosis. This was a reliable method.

As to the question of Dr. Hayd, with reference to examining the intestine beyond the involved area, in typhoid-fever perforation one could pretty definitely tell the number of perforations. He would remove the exudate and then disturb the patients just as little as possible, even when he flushed. He did not agree with Murphy that some of these cases may be drained and not flushed, as some of them had an exudate which must be removed.

As to local anesthesia, it was valuable in some cases, while others needed to be given a general anesthetic.

DR. DAVIS then reported a case of perforation he did not refer to in his paper in which there were two perforations. The man had several hemorrhages. He operated on him in profound shock, found a perforation within four inches of the ileum, and one about eighteen inches. Both perforations were closed. The perforations were small, and no exudate could be found. The man was in the fourth week of typhoid fever, and had had the starvation treatment. There was nothing in the bowel to escape. He drained, and immediately after making a peritoneal toilet, he tried the Crile method of transfusion. He operated without an anesthetic. The man became conscious shortly after the operation and did splendidly until the fifth day, when he developed pneumonia and died on the eleventh day. Postmortem examination showed three perforations, which occurred after the operation, about six inches from the ileocecal valve. He thought drainage would have taken care of them if pneumonia had not supervened. In many of these cases one would get a subsequent perforation.

DR. JOHN A. LYONS, of Chicago, read a paper entitled

TYPHLITIS.¹

DISCUSSION.

DR. ROBERT T. MORRIS, of New York City, had had two cases of perforative typhlitis or perityphlitis, one acute, the other chronic. In the acute case perforation occurred as a point about two inches from the appendix. The patient had peritonitis when he saw him. The case was diagnosticated as appendicitis by the family physician. The appendix was not involved except for some moderate degree of interstitial serous exudation.

¹ To appear later in this Journal.

The cecum was perforated. The patient recovered from the peritonitis.

The other case was one in which perforation had occurred some months previously. The patient recovered under medical treatment, as these patients did sometimes with pus in the peritoneal cavity. There were so many adhesions that the speaker operated for their separation. A diagnosis of appendicitis was made at the time of the acute attack. In separating the adhesions he found the site of the perforation, which was about four inches from the appendix. The circular perforation had left a distinct scar, and the hard, firm white adhesions at this point left no doubt as to the character of the original attack.

DR. ALBERT GOLDSPOHN, of Chicago, read a paper entitled

SOME OLD FALLACIES IN RETROVERSION SURGERY.¹

DR. JOHN E. CANNADAY, of Charleston, W. Va., followed with a paper entitled

REPAIR RATHER THAN REMOVAL OF THE INTERNAL GENERATIVE ORGANS OF WOMAN.²

These two papers were discussed jointly.

DR. HERMAN E. HAYD, of Buffalo, concurred with the essayist in his criticism of the Coffey operation. He was glad to hear the essayist say that in entering the abdomen for the relief of any pathological condition it was best to do so in the median line and not by the inguinal method, since the operation of Gilliam was satisfactory if the abdomen had to be opened.

There was no use of discussing the Alexander operation because he took the same position now that he had heretofore, namely, that this operation was well suited to uncomplicated cases of retroversion.

DR. ROBERT T. MORRIS, of New York, in speaking of Dr. Cannaday's paper, remarked that conservative surgery in the pelvis should be done whenever possible, saving everything one could. The patient, however, should be taken into the confidence of the surgeon and the surgeon in turn should be guided by the wishes of the patient.

DR. THOMAS B. NOBLE, of Indianapolis, remarked that in contemplating operation for retroverted uterus, one should consider much more than that. In these cases many of them were attended by a general visceroptosis; they were attended by great lengthening of the uterosacral ligaments, by ruptures of the perineal floor, so that from the diaphragm to the perineum the supportive elements were lacking, and the symptom-complex was such that hardly any case could be attacked by a procedure directed to the round ligaments, the broad ligaments, a ventrosuspension or fixation, or any one particular thing. This was one of those pathological complexities that caused him more concern than any of the plastic work he was called upon to perform.

¹ See original article page 1035.

² See original article page 1042.

EXPERIMENTS UPON ANIMALS RELATIVE TO THE QUESTION OF ABDOMINAL SUPPORTERS AFTER LAPAROTOMY.

DR. ROBERT T. MORRIS, of New York, read a paper on this subject.

DISCUSSION.

DR. WALTER B. CHASE, of Brooklyn, asked what inference the essayist would draw, if any, from his experiments on the propriety of deciding the length of time when a patient should get up after an operation.

DR. JOHN E. CANNADAY, of Charleston, W. Va., said that the time for the prevention of postoperative hernia was at the time of operation, by getting proper closure of the wound, and that the wearing of bandages and supporters could not have any possible bearing on the case. If one avoided the dissection of trophic nerves, made short incisions, and effected good approximation of tissues, there would not be a hernia. He did not advise the wearing of a support of any kind after operation.

DR. MILES F. PORTER, of Fort Wayne, Indiana, said that, as a general proposition, he quite agreed with what Dr. Morris and others had said. He protested, however, against the statement of the last speaker that absolutely nothing, except the suturing of a wound, had anything to do with the development or lack of development of a postoperative hernia. It had very much to do with it. He did not care who sutured the wound, how he did it, nor what he did it with, if pressure were brought to bear on the wounded surface before the parts had completely and finally closed, even reinstated to the condition that obtained prior to operation, the patient would likely have a hernia or would run the chance of having it.

As to whether a supporter should be used after operation, it depended very largely upon where and how the incision was made. He undertook to say that McBurney's incision never needed any support, because of the mechanical principles that obtained in the muscle separation. On the other hand, a vertical incision in the semilunar line needed support, and if one did not have support there until the connective tissue had been restored, a hernia was likely to occur. These herniæ did not develop in two or three or four years, but later.

DR. MORRIS, in closing the discussion, and replying to Dr. Chase, said that he kept some patients in bed much longer than others. For instance, he kept a good many patients in bed for sixteen or seventeen days, and sometimes for twenty-one days. After a McBurney short incision for an appendix operation, where the structures were split and nothing else was cut, the patient was allowed to get out of bed at the end of six or seven days, and to go home in ten days. On the other hand, when an incision was made three inches long in the semilunaris, he kept the patient in bed three weeks. He would only permit of a supporter being used for a few days, while the patient was

walking about. This might consist of a rubber-plaster supporter. He had in mind doing away with these elaborate supporters, which were not only worn for months but years after these operations.

Papers were also presented by Drs. HALL, VANDERVEER, KIRSCHNER, STEWART, HEDGES, SHERRILL, and TORRANCE.¹

OFFICERS.

President, DR. WILLIAM H. HUMISTON, of Cleveland, Ohio.

First Vice-president, DR. JAMES EDGAR SADLIER, of Poughkeepsie, New York.

Second Vice-president, DR. JOHN D. S. DAVIS, of Birmingham, Alabama.

Secretary, DR. WILLIAM WARREN POTTER, of Buffalo, New York, re-elected.

Treasurer, DR. X. O. WERDER, of Pittsburg, Pennsylvania, re-elected.

Fort Wayne, Indiana, was selected as the place for holding the next annual meeting, September 21-23, 1909, being the date.

REVIEWS.

UEBER SALPINGITIS NODOSA. By DR. RUDOLPH MARESCH, Adjunct Prosektor in der K.-K. Krankenanstalt in Wien. 17 text figures and 2 plates. Octavo. 72 pages. S. Karger, Berlin, 1908.

This monograph treats of the so-called adenomyoma of the tubal angle. Just as Cullen has put at rest the various theories in regard to adenomyoma of the uterus by showing that in the great majority of the cases the so-called "new-growth" is derived from outgrowths of the uterine mucosa, so Maresch has demonstrated that the adenomyomata of von Recklinghausen are usually due to inflammatory changes of the tube and not to embryonal rests of the Wolffian body. In one series of cases the method of reconstruction of serial sections was employed; in a second series, gelatin injections of the tubal lumen were utilized. The work is painstaking, thorough and convincing.

R. T. F.

DIE BECKENERWEITERNDE OPERATIONEN. By DR. AUGUST MAYER, Privatdocent in der Universität u. Oberarzt in Universitäts-Frauenklinik zu Tübingen. 67 text figures. Octavo. Pages 218. S. KARGER, Berlin, 1908.

The author has given a very complete résumé of the subject, including both symphysiotomy and hebosteotomy. He reviews the knowledge of the anatomy of the pelvis, tracing it from the earliest times to the present. Symphysiotomy is applicable to clean cases, whose true conjugate is not below 6.75 cm. The mortality of the operation is from 11 to 12 per cent. In discussing hebosteotomy, the anatomy of the parts is carefully and mi-

¹ These papers will be published in this Journal.

nutely shown. Both the open and the subcutaneous methods are discussed. About 260 cases had been reported up to the time this monograph was written. The true conjugate must be at least 6.5-7 cm., or at least 1 cm. bigger in a generally contracted pelvis. After the operation labor should always be awaited, if possible, in order to avoid penetrating vaginal tears. Injury to the bladder usually heals spontaneously if a permanent catheter is left *in situ*. Of the nine cases reported by Mayer, one died of hemorrhage, and only six of the children were born alive. Reports of animal experiments on the healing of bone wounds conclude this monograph. Anyone interested in this subject will find a comprehensive review in this work.

THE CAMPAIGN AGAINST TUBERCULOSIS IN THE UNITED STATES.

Including a Directory of Institutions Dealing with Tuberculosis in the United States and Canada. Compiled under the direction of The National Association for the Study and Prevention of Tuberculosis. By Philip P. Jacobs. Pp. 467. New York: Charities Publication Committee, 1908.

The great impetus which has recently been imparted to the crusade against tuberculosis is no way better attested than by the fact that of one-hundred and fifty-eight dispensaries for its treatment, one hundred and twenty-three have been established within the nineteen months preceding August, 1908. This volume has been prepared through the cooperation of the Russell Sage Foundation and the National Association for the Study and Prevention of Tuberculosis. It is really a revision of the "Directory of Institutions Dealing with Tuberculosis" with the inclusion of chapters on legislation dealing with the disease. It presents concisely the chief data concerning sanatoria, hospitals, day camps, dispensaries, classes, associations and other institutions for tuberculous patients. These include the situation, type of cases admitted, capacity, charges, medical attendance, method of application for admission and other more general information. While of particular value to those whose practice deals largely with tuberculous patients, it is a volume which helps to solve problems that almost all physicians in general practice are called upon to face. H. D.

GYNECOLOGY AND ABDOMINAL SURGERY. Edited by HOWARD A. KELLY, M. D., F. R. C. S. (Hon. Edinb.), Professor of Gynecologic Surgery at the Johns Hopkins University; Gynecologist to the Johns Hopkins Hospital, Baltimore, and CHARLES P. NOBLE, M. D., Clinical Professor of Gynecology at the Woman's Medical College, Philadelphia. In two large octavo volumes of 1713 pages and 880 illustrations by Norman Becker, Max Broedel and others. Volume ii. W. B. Saunders Co., Philadelphia and London, 1908. Per volume \$8.00.

The chapters of the second and concluding volume of this work begin with Complications following Operations, by G. Brown Miller and go on through Cesarean Section, by J. F. W. Ross; Opera-

tions during Pregnancy, by Richard C. Norris; The Operative Treatment of Sepsis in the Child-bearing Period, by Barton Cooke Hirst; Extrauterine Pregnancy, by J. Whitridge Williams; Diseases of the Female Breast, by J. C. Bloodgood; Operations upon the Gall-bladder, Bile Ducts and Liver, by Alfred J. Ochsner; Operations upon the Stomach, by B. G. A. Moynihan; Pyloroplasty, by J. M. F. Finney; Intestinal Surgery, by John B. Murphy; Operations for Diseases of the Vermiform Appendix, by Kelly and Hurdon; Surgery of the Pancreas; by Opie and Watts; Operations upon the Spleen, by Kelly; Tuberculosis of the Peritoneum, by George Ben Johnson; Penetrating Wounds of the Abdomen, by Floyd W. McRae; Hernia, by Hunner; Inguinal Hernia in Men, by Edward Martin; Drainage in Abdominal and Pelvic Surgery, by Anspach; Surgery of the Ureter, by Kelly, and Surgery of the Kidney, by Noble and Anspach.

In general, these chapters are well written, express clearly the authors personality, show little repetition, and are open to criticism only in certain minor points. In the chapter on extrauterine pregnancy it might be as well, for the sake of uniformity, to omit the six pages of references to literature, as is done in all of the other forty-three chapters.

The illustrations, mostly by Becker and Broedel are as beautiful as ever and hardly need more than mention. Most of them are remarkably fine, yet some exemplify the fact that diagrams may teach better than detail. Figs. 410, 411 may be criticised as showing a preposterously long incision for Cesarean section. Some of the photographic reproductions showing amputation of the breast are so obscured by detail as to be practically useless for teaching the steps of the operation. For instance, Fig. 538 is ornamented by more than fifty-five pairs of artery forceps. Nine-tenths of the points shown as clamped in this figure should have been left alone. In Fig. 556 the anatomy of the bile-ducts as shown may possibly be considered unusual.

The first volume of this work was reviewed in the *Journal* for October, 1907 (page 527). It contains only matter which is strictly gynecological and as such almost wholly admirable. The second volume, which reaches out to the stomach, pancreas, spleen, and hernia in men would seem deliberately to cross the line and go well into the domain of other departments of surgery and in doing so must and does tend to break down the dividing lines and so make gynecology only a subfield in general surgery. The pendulum of professional custom and inclination may be now swinging strongly that way but there are many who have the true interests of gynecology at heart who feel that this movement is nearly at the end of its arc and that the reaction will be soon and strong.

As specimens of bookmaking these volumes are models of luxuriousness. The type impression is clear and sharp, the reproduction of the drawings remarkable, and the binding so good that the page lays flat wherever opened. The very glossy surfaced paper

necessary for the reproduction of the fine half-tones is at present a necessary evil.

A TEXT-BOOK OF THE DISEASES OF WOMAN. By CHAS. B. PENROSE, M. D., Ph. D., Formerly Professor of Gynecology in the University of Pennsylvania. Sixth revised edition. Octavo of 550 pages, with 225 original illustrations. W. B. Saunders Co., Philadelphia and London, 1908. Cloth \$3.75.

It speaks well for the care and judgment with which the original edition of this book was planned to find that now, after its sixth revision, it has increased in size by only twenty-one pages. It is characterized by simplicity of style and clear teaching. Major operative gynecology is subordinated. Theoretical discussions, case reports, and other padding are conspicuous by their absence. Many of the cuts are diagrammatic but teach as clearly as more elaborate illustrations. The restriction to one plan of treatment for each disease simplifies the subject for the student but emphasizes the fact that this is distinctively a text-book and not a work of reference for the practitioner.

TEXT-BOOK OF NERVOUS DISEASES AND PSYCHIATRY. By CHARLES L. DANA, A. M., M. D., LL. D., Professor of Nervous Diseases in Cornell University Medical College; Visiting Physician to Bellevue Hospital; Neurologist to the Montefiore Hospital; Neurologist to the Woman's Hospital; Consulting Physician to the Manhattan State Hospital; Ex-President of the American Neurological Association; Ex-President of the New York Academy of Medicine; Corresponding Member of the Société de Neurologie. Seventh Edition. Octavo of 782 pages. Illustrated by two hundred and sixty-one engravings and three plates in black and colors. William Wood and Co., New York, 1908. Cloth \$5.00

Dr. Dana gives us in this book an example of simple, straightforward, clear thinking, expressed in language which has an admirable teaching quality. These factors have given the book a vitality that has carried it through seven editions with no impairment of its "vital rubber." In the present volume the author has made some additions to the sections on the histology of the neuron and on the anatomy and physiology of the brain. A very sane little section has been written regarding the methods of psychotherapy. The subjects of neurasthenia, hysteria and psychasthenia have been rewritten. Considerable has been added to the subjects of neuritis, tabes, multiple sclerosis, brain tumors, the tics, and paralysis agitans. Some new illustrations have been added.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Production of Deciduomata and the Relation between the Ovaries and Formation of the Decidua.—Leo Loeb (*Jour. Amer. Med. Assn.*, June 6, 1908) has obtained multiple nodules that have the structure of the decidua of the guinea-pig by making transverse and longitudinal cuts in the uterus of the anesthetized animal. The different stages in their development were established by microscopic examination. The nodules originate through proliferation of the interglandular connective tissue of the mucosa by mitotic cell division. The beginning of these changes may be observed within twenty-four hours after the operation and the deciduomata reach their full size in ten or eleven days. The cells then die rapidly and the tumor becomes completely necrotic, as a rule, within fifteen days after the operation. Necrosis cannot be prevented by the coexistence of pregnancy, although it is possible that the life of the deciduomata may be slightly prolonged under these conditions. If the incisions are made from the fourth to the eighth day after copulation deciduomata almost invariably develop. Inside the first day after copulation no deciduomata usually develop. On the second day only very small or no deciduomata develop. On the ninth and tenth days after copulation, again, the formation of deciduomata becomes very uncertain; and it is absent in later stages of pregnancy. The optimum, between five and eight days, corresponds with the time when the uterus normally responds to the stimulation of the ovum with the formation of a decidua. Preceding copulation is not, however, necessary for the formation of deciduomata. At certain periods after the condition of heat has passed in animals the uterus likewise responds to the proper stimulation with the production of deciduomata, the optimum lying at 4 to 9 days after the period of heat. The writer believes that the development of the deciduomata depends on a certain condition in the sexual cycle of the animal at the time of operation, and says that he has shown that the contact of the ovum with the mucous membrane is not necessary for their development. Extirpation of the ovaries in most cases prevents entirely the formation of deciduomata in animals that are operated on at the most favorable period after copulation. Cauterization of the ovaries several days before incising the uterus does not interfere with the formation of deciduomata. Their development in pieces of uterus transplanted, at the proper time after copulation into the subcutaneous tissue, makes it probable that an internal secretion of the ovaries is responsible for the predisposition of

the uterus to form deciduomata. The writer believes the corpus luteum secretes this substance. The invariable necrosis of the deciduomata at a certain period of their development must be compared to the general disappearance of the corpus luteum after the causative factors leading to its development have ceased to exist. If the "internal secretion" of the ovaries is of great significance for the production of deciduomata, we are justified in concluding that it has the same significance for the formation of the placental decidua.

Analgesia in Obstetrics and Gynecology.—W. J. Sinclair (*Lancet*, May 30, 1908) discusses the various methods of relieving pain in obstetrical practice and suggests the advisability of employing a combination of morphine and alcohol and the local use of cocaine if necessary, varying the dosage of each according to the habits and racial temperament of the patient. For such operations as curettage in puerperal sepsis he would avoid chloroform and ether unless necessary as the anesthetic may turn the scales against the weakened patient. The following method will be found sufficient for curettage. About three-quarters of an hour before the operation the patient receives a full dose of morphia hypodermically—a quarter of a grain, more or less, according to her bulk. Half an hour or 20 minutes before the time appointed for operation she is given about two or three fluidounces of whiskey or brandy disguised with licorice and diluted. If she is accustomed to alcoholic beverages, as most hospital patients are, she must get more. By the appointed time, when everything is ready, the most timid patient has become apathetic, but if there is laceration of the perineum it is well, as a preliminary, to mop the surface which has to be cleansed with a solution of cocaine, eucaine, or novocaine.

Chorea During Pregnancy.—In a previous report of nine cases, W. F. Shaw (*Jour. Obst. and Gyn. Brit. Emp.*, June, 1908) reached the conclusion that the chorea of pregnancy is due to a toxine which appears to be identical with, or closely to resemble, that of acute rheumatism. It affects human subjects under two circumstances, both of these being characterized by instability or irritability of the nervous system, namely, childhood and pregnancy. The cause of the instability or irritability of the nervous system in pregnancy, bringing it down to the level of childhood, is the toxemia of pregnancy. He believes that in the chorea of pregnancy it is more important to remove the predisposing cause than to apply merely symptomatic treatment. The treatment must be eliminative as in the other toxemias of pregnancy. The pregnancy should not be arrested, as a rule, as this is generally unnecessary and harmful to the patient as well as to the child. His routine treatment is to keep the patients quiet in bed on a diet restricted entirely to milk, until the movements show signs of improvement, when the diet is gradually increased, always returning to the milk if there is any increase of the symptoms. Elimination by the skin and kidneys is encouraged

by administering a simple saline diaphoretic and diuretic mixture, and the bowels are kept well opened by calomel or jalap. If a severe case does not respond, eliminative treatment is more vigorous and includes saline enemata. One of the strongest proofs that this treatment is conducted on rational lines is the fact that in none of twelve consecutive cases were any hypnotics administered. So soon as elimination is increased, as shown by an increase in the output of urea and uric acid, although the diet is restricted to milk, natural sleep occurs, generally on the second or third night. The writer's first two cases were treated on traditional lines and labor was induced finally, both mothers and children perishing. The remaining twelve cases, including three now reported, were all treated as described above. All the mothers made excellent recoveries, and the children, except two, were born healthy, or the mothers discharged as cured before delivery and with the fetal heart audible. The two still-births were due to an accident at birth and to pneumonia of the mother.

Creatinin Excretion in the Puerperium and Uterine Involution.—

C. N. Longridge (*Jour. Obst. and Gyn. Brit. Emp.*, June, 1908) has made observation during the first nine days of the puerperium with a view to determining the output of creatinin during the most active period of involution of the uterus. He found a fall during the first day or two, probably due to the fact that the patients had not been placed upon a creatinin free diet for three days before the observations were started. On the sixth day the low percentage is due to the high excretion of total nitrogen. With these exceptions the percentage excreted as creatinin remained about 3 per cent. for the whole period. No increase of creatinin excretion was found during the most active period of autolysis of the uterus. The writer formulates the following conception of the process of involution. During labor the powerful contractions of the uterus lead to the development of sarcolactic acid in the uterine wall. This acid is neutralized by the circulating blood. When the uterus contracts down after the expulsion of its contents, it is probable that the formation of sarcolactic acid still goes on, but now there is no blood to neutralize it. The uterus is therefore left in a condition of anemia and diminished alkalinity, two factors which favor rapidity of autolysis. The wall of an autolyzing uterus removed by the Porro-Cesarean operation was found thirty-six hours after the operation to be of a distinctly acid reaction. During the first stage of involution when the circulation through the uterus is slight or even completely absent the products of autolysis are retained in the uterus. After four or five days the uterus becomes considerably softened, and the blood begins to percolate more freely through the organ. The products of autolysis are then washed out, and owing to the presence of alkaline blood, the rate of autolysis is very much diminished, and the second or slow stage of involution begins.

Pyelonephritis Complicating the Puerperium.—C. G. Cumston (*Amer. Jour. Med. Sci.*, July, 1908) says that, given elevation of the temperature during the puerperium, one should commence by a careful examination of the uterus and adnexa, and, having found that there is no lesion in the small pelvis, the possibility of a pyelonephritis should at once come to one's mind; a careful examination of the urine should be made, as well as a methodical palpation of the renal region and ureters, although the patient may be perfectly free from pain in these regions.

Fixation of Bile Pigments in the Placenta.—Odorico Viana (*Ann. di Ost. e Gin.*, June, 1908) has made a study of eight cases of icterus in pregnancy, among which four died with acute yellow atrophy of the liver, with reference to a possible deposit of bile pigments in the placenta affecting the life of the fetus. Chemical and microscopical examinations of the placenta were made. He concludes that the presence of bile pigments in the alcoholic extract from a placenta in a case of icterus does not show that these substances have been fixed in the placenta, because they may come from the blood that is mixed with the solution. In the most severe cases the microscope demonstrates the deposition of only a small amount of bile pigment in the syncitium, and this is absent in the catarrhal forms of icterus. The belief that the pigments are in combination with the calcium of the placenta is not supported by the author's observation of the placenta. We must admit a certain amount of passage of the bile substances from the mother to the fetus, but this probably does not cause the death of the fetus, which generally occurs in severe cases, while in catarrhal cases the child lives. It is more likely to be caused by the passage of toxins circulating in the maternal blood.

Osteomalacia.—P. Stephanelli and Ettore Levi (*Rivista Critica di Clin. Med.*, June 27 and July 4, 1908) espouse the theory that osteomalacia is an infective disease. They have made a detailed study of two cases. One of them died in the hospital at Florence, and careful bacteriological and pathological examinations were made postmortem. The changes in the bones were general and less marked in the pelvis than in other parts of the body. There were multiple fractures of the long bones, the thorax being markedly deformed, resulting in severe dyspnea. Bilateral ovariectomy had been done, but had no effect whatever on the progress of the affection. The result was an enormous deposit of fat all over the body. There were no symptoms referable to the nervous system. From the body was isolated postmortem a microorganism resembling the diplococcus described by Morpurgo as found in osteomalacia and rickets in white rats. It is colored by Gram's stain. Injected into animals, it did not produce any inflammation nor any general infection. This diplococcus was promptly agglutinated with serum of osteomalacia in dilution of one to twenty or thirty. No osteomalacic symptoms were found in the inoculated animals.

Successful inoculation experiments have been made by Archangelis and Fiocca, leading the author to believe that in man as well as in animals this disease is an infection probably caused by the same pathogenic agent. The disease is not equally distributed in all countries. It is seen in Italy especially in the small mountain villages. In one-third of the cases the disease strikes several members of the same family. Among animals the contagious nature of the disease is more marked. Spontaneous epidemics of osteomalacia have been noted in rats, the disease passing down to the third generation. Admitting the contagious nature of the disease, it is not difficult to see how it spreads. The organisms may enter by the tonsils, skin or intestinal canal. Archangelis thinks that the puerperal uterus is an especially easy point of entrance for the microorganisms. The infection may remain latent for a long time and give rise to relapses. Sex is a predisposing cause of importance, the condition being rare in the male. Its onset is like that of infectious diseases, beginning with fever and diffuse pain in the articulations and bones. The fever is generally of short duration, is slight, and recurs in the advanced stages of the disease. Most cases begin in spring and autumn and improve in summer. It is supposed by the author that the organism acts directly on the osteoblasts and bone cells.

Stomato-dental Affections in Pregnancy.—Emile Ely (*Jour. de Méd. de Paris*, September 26, 1908) says that pregnancy gives rise to three kinds of stomatopathies. The first set consists of salivary difficulties, consisting of abnormal acidity of the saliva, and ptyalism, and are due to autointoxication. The use of alkaline gargles is indicated. Gingivitis, stomatitis and other buccal affections arise from the same cause as salivary troubles. Antiseptic and astringent gargles and treatment with lactic acid bacilli are indicated. Odontalgia is sometimes secondary to caries and is relieved by treatment of this condition. In general it is due to the decalcification of pregnancy. There is a marked acidity of the mouth and increase in the number of its microorganisms, which aid in the occurrence of caries. The decalcification should be met by a proper diet and the administration of salts of lime. The use of salt should be interdicted, and the carious teeth filled temporarily with gutta-percha, which should be inspected once a month. Permanent fillings should not be put in until some time after the termination of pregnancy.

Ocular Complications of Pregnancy.—Hiram Wood (*Jour. Amer. Med. Assn.*, July 18, 1908) states that, apart from the various nervous symptoms incidental to pregnancy which often affect the eye functions, four serious ocular manifestations are seen more or less frequently during pregnancy or after parturition. These are: 1. So-called uremic blindness, usually seen in connection with eclampsia, 2. albuminuric retinitis of pregnancy. Rarer forms are: 3. loss of central or peripheral vision, due, so far as symptoms point, to a retrobulbar neuritis, and 4.

a form of neuroretinitis, not essentially suggestive of the albuminuric type, but showing numerous retinal exudates and hemorrhages. There is doubt as to whether the term uremic should be applied to the blindness occurring in connection with puerperal eclampsia. The same is true regarding the renal origin of what is termed the albuminuric retinitis of pregnancy. There is good reason to think that both the renal and ocular complications are manifestations of the same process—a toxæmia. The third and fourth varieties of ocular complications of pregnancy are also, doubtless, the results of pregnancy toxæmia, a toxic neuritis or toxic thrombosis probably being the active factor in causation.

Semiology of Incoercible Vomiting in Pregnancy.—M. E. Bonnaire (*Presse Méd.*, September 5, 1908) tells us that incoercible vomiting in pregnancy may occur at any period of the gestation. At first the vomiting causes emaciation, being intermittent, accompanied by malaise, lack of appetite, nausea and vertigo. The stomach ejects a mixture of mucus and bile. Nausea is persistent and retching violent and painful. Ptyalism is present, the mouth having a bad taste. Food may stagnate some hours in the stomach and then be rejected with an excessive fetidity. Liquids and solids burn the stomach, and the tongue is red and shining. Violent vomiting causes hemorrhages of the nose, eyes, and ears. Constipation is intense and obstinate. The urine is diminished in amount, reaction acid; uric acid is in excess, and chlorides are decreased. Abnormal extractives are present. In the second period all the symptoms are exaggerated and there is an acceleration of the pulse, accompanied by a lowering of the temperature. Feebleness is extreme; boils and acne appear, and the extremities are cold and cyanotic. Thirst is extreme and emesis violent. Insomnia is the rule. Arterial tension is low and the heart arrhythmic. In the last stage there is an apparent improvement in that the vomiting stops, food is retained although undigested, and diarrhea is present. This lasts from three days to a week and ends in death.

Uterine Cicatrices and their Rupture.—P. Mauclair and Burnier (*Arch. Gén. de Chir.*, August, 1908) enumerate the conditions and operations on the uterus that cause cicatrices in its substance which may be involved later in rupture. Situation of the placenta over such a scar weakens it. The distention of the uterine walls as parturition approaches is the principal immediate cause of the rupture. Decidual cells may have invaded the cicatrix and separated the muscular fibers. The cicatricial tissue is less elastic than the rest of the wall. Rupture comes on suddenly, generally with a severe pain and indications of internal hemorrhage. The abdomen becomes ballooned and hypersensitive. The infant soon dies, and auscultation shows that the heart-beats have stopped. Palpation may show the body of the fetus in the abdominal cavity and the uterus contracted at one side. Blood flows from the vagina. The prognosis for the child is bad,

death generally occurring soon after it passes into the abdomen. The prognosis for the mother is almost equally bad if operation is not undertaken soon. Preventive treatment would be in the line of obtaining a strong cicatrix of any abdominal wound by care in the method and the material of the sutures. The authors report twenty-two cases of rupture of the cicatrix after operations on the uterus.

Unilateral, Polypoid, Edematous Elongation of the Cervix, a Complication of Labor.—Jules Rouvier (*L'Obst.*, August, 1908) says that edema of the cervix during labor may be present to such a degree that a portion of the cervix in shape resembling a polypus descends before the head of the fetus. This necessitates in most cases some intervention to crowd back the mass into the pelvic cavity during the contractions or to deliver by forceps or version. A slight degree of this condition which will undergo a return into the pelvis is often seen, but the advanced degree in which the mass of variable size appears like a polypus is exceedingly rare. The author had in his hospital practice a remarkable example of this difficulty. The seat of the elongation is the anterior lip of the cervix. The cause is interference with the circulation in the cervix by the pressure of the head. When dilatation is slow it is more apt to occur. It is sometimes associated with pelvic contraction. In some cases the edematous lip of the cervix tears away from the rest of the cervix; in some it remains in the vagina; in others it appears below the vulvar orifice. It is of a livid, violet color, and when the capillaries become ruptured so that there is extravasation of blood within it it is blackish in color. The patient suffers severe pain in the elongated portion. The elongation may persist for some time after the delivery and when it does so may need to be removed by operative procedure. It may be confused with prolapsus of the mucosa of the vagina, with a vascular polypus, with a fibroid tumor of the cervix, and with a portion of the placenta. In severe cases the contractions become irregular and sometimes cease and inertia uteri ensues. In such cases the life of the child is endangered by the prolonged pressure to which it is submitted. Early diagnosis, spontaneous resolution, or separation of the tumor are favorable to the mother. When the amniotic sac has not ruptured and the contractions are weak it is justifiable to endeavor to put off labor. After rupture, dilatation should be facilitated. Attempts should be made to support the prolapsed portion and push it up between the pains. It may be necessary to aid delivery by version or forceps, and the lip should be supported between the tractions. After delivery the tumor disappears in most cases in a few days.

Suppurative Cerebrospinal and Cerebral Meningitis in the Puerperium.—F. Commandeur (*L'Obstet.*, June, 1908) says that infection of the brain and meninges in the course of puerperal infections is very rare. Interest in such cases is along three lines: etiology, diagnosis from eclampsia, and obstetrical indications. The author has collected fifteen cases, one of them

observed by himself, and has analyzed them. One of the predisposing causes is multiparity, the frequency varying with the time of the gestation, and most of them occurring in the latter part of pregnancy. In the puerperium the symptoms begin immediately after delivery or as late as four weeks after it. In general it occurs near the time of delivery. In ten cases it was primary, in four it complicated another affection, pneumonia or pleurisy, and once a staphylococcus infection of the uterus. Bacteriological examination showed in general the pneumococcus. The symptoms are generally atypical, resembling eclampsia. They consist of headache, appearing early and becoming aggravated in severity; convulsions, generally present, and terminal coma. There may be delirium, pupillary changes, severe fever and urinary troubles, less severe than in eclampsia. Diagnosis involves a careful analysis of the symptoms. It is generally made only at the autopsy. The headache is more intense and progressive than in eclampsia; coma generally succeeds the convulsions and continues until death. Presence of much albumin speaks for eclampsia. The symptoms are progressive to a fatal termination. The prognosis for the mother is bad, but the infant is often delivered alive, either spontaneously or by operation. It is not necessary to bring about premature labor in the interests of the child, for labor generally comes on spontaneously.

GYNECOLOGY AND ABDOMINAL SURGERY.

Vermiform Appendix as a Pelvic Organ.—J. Bland Sutton (*Clin. Jour.*, July 1, 1908) calls attention to the frequent finding of the tip of the appendix in contact with the gall-bladder of normal size and normally situated, and its more common occurrence in the pelvis and resting on the rectum. An acute appendicitis, when the tip of the appendix is free in the pelvis, mimics, not only pelvic abscess, tubal pregnancy, and pyosalpinx, but it may actually set up acute salpingitis and ovaritis. Subacute and chronic diseases of the appendix may extend to, and involve the right ovary and Fallopian tube. The writer mentions several cases. In one, the appendix had perforated and discharged into the tubal ostium, setting up an acute salpingitis. The tendency of perforation of the appendix to occur at or near its free extremity the author ascribes to the abundance of lymphoid tissue at this point. In another of his cases a persistent abdominal sinus was found to be due to perforation of the tip of the appendix which had become adherent to the abdominal wall. The probe passed through the appendix into the cecum. He records a case with symptoms of subacute appendicitis in which he found a long vermiform appendix reaching into the pelvis, firmly adherent to the pelvic wall below the iliac vessels and containing a hard body at that point. This was found to be a concretion surrounding a pin and consisting of calcium phosphate, calcium oxalate, iron, and magnesium ammonium phosphate.

A pin in the appendix may perforate into the bladder as may pelvic abscesses arising from perforation of an appendix independently of such a foreign body. The appendix may also be found in a hernial sac.

Sterile Oil to prevent Peritoneal Adhesions.—From experiments upon cats and limited clinical data J. B. Blake (*Surg. Gyn. and Obst.*, June, 1908) concludes that oil, absolutely sterile, may be used in the peritoneal cavity of patients in moderate quantities, 1 to 4 drams, without danger, general or local; that it remains in the peritoneal cavity for periods of from five to fifteen days, and possibly even longer; that its presence tends to prevent early and direct adhesion of denuded or inflamed peritoneal surfaces, and, therefore, that its use, under the above precautions, is indicated and is moderately effective in sometimes preventing and usually diminishing the formation of post-operative peritoneal adhesions.

Treatment of Displacements of the Pelvic Viscera.—W. E. Fothergill (*Jour. Obst. and Gyn. Brit. Emp.*, June, 1908) recommends for classical prolapse anterior colporrhaphy with union in the middle line of the parametric and paravaginal tissues; posterior colporrhaphy and perineorrhaphy. He favors ventrofixation in addition to the above, if the anterior colporrhaphy does not support the uterus in a position of anteversion. For cystocele and vaginal prolapse he performs anterior colporrhaphy and perineorrhaphy. For retroversion demanding treatment he advises Alexander's operation as an alternative for pessary if the uterus is movable; laparotomy, separation of adhesions, treatment of appendages and securing of uterus in anteversion, if it is fixed.

Dysmenorrhea.—C. C. Norris (*Univ. Penn. Med. Bull.*, June, 1908) presents a study of nine cases of dysmenorrhea. He finds that dysmenorrhea accompanied by labor-like pain is often due to a form of membranous dysmenorrhea, and that the shreds of tissue passed are often extremely small, but that this does not prevent them from causing marked obstruction symptoms. Histological study of the shreds show an inflammation present, even though no evidence of infection can be noted in the case clinically. The passage of shreds, if the cervix is a multiparous one, is not necessarily accompanied by pain. In the writer's hands the best results have been attained from a dilatation and curettage followed by the insertion of a Wylie's drain, together with tonics and improved hygiene, under this treatment sterility may often be overcome.

Menstruation in Relation to Calcium Metabolism.—From a study of this subject W. B. Bell, (*Proc. Royal Soc. Med.*, July, 1908) concludes: 1. That menstruation is a periodic function only in so far as the rest of calcium metabolism is in harmony with this periodicity, and that the function is dependent upon the calcium metabolism in all its ramifications. 2. That the hemorrhage into the Graafian follicle may be coincidental

and is the result of the lowered calcium content of the blood, but that it is in no way responsible for menstruation. 3. That the bleeding from the uterus, while due to the lowered calcium content of the blood in the main, is also dependent on the local change in the capillaries from which the diapedesis of leukocytes and corpuscles occurs, and, further, that these leukocytes are an active factor in the conveyance of calcium salts from the glands to the exterior. 4. That the uterine glands excrete calcium and mucin, and that therefore the uterus is a "menstrual organ." 5. That there is a correlation between the ovaries and uterus in reference to menstruation, but that the ovary is probably no more predominant than other ductless glands in this respect.

Lymphatics and Uterine Cancer.—C. Jacobs (*Prog. Méd. Belge*, July 15, 1908) explains the spread and recurrence of uterine cancer in part as due to the lymphatic vessels which so richly permeate the pelvic tissue with the large number of associated lymphatic glands. The other method of spread is by way of the blood-vessels. The metastases in the kidneys and liver occur through the venous system. Isolated vaginal metastases which are found under an intact mucosa may be explained by a retrograde transfer of the cancerous germs through the veins. Such occurs also in the region of the saphenous vein in the texture of the skin. Uterine tumors progress through interstitial spaces devoid of epithelium. Cancer of the vaginal portion of the cervix extends upward in the external third of the muscular tissue and downward in the subvaginal tissue. Cancer of the cervix near the external os extends toward the cervical mucous membrane, destroys the cervix, and forms a conoidal cavity with its apex upward. Cancer of the upper cervix progresses laterally into the parametrium. Cancer of the body of the uterus passes by way of the lymphatic spaces of the body and infects the subserous tissue. The lymphatics of the external muscular layer being large, the march of the disease is rapid as soon as they are reached. These tumors spread continuously. As soon as they penetrate the lymphatics and blood-vessels a current of cancer juices is established from the neoplasm to the rest of the body. Fragments of detached tumors are carried to a distance. This process is interrupted by venous thromboses. Such thromboses are never present in the lymphatics, the cancer bits being borne along to distant regions. Cancer cells carried about the body are at first destroyed, but when they become numerous enough the body resistance is not equal to their destruction and they lodge and grow. The lymphatic glands do all that they can to stop their progress and are themselves infected. Passage of cells through a gland is mechanically impossible. Cancers of the lower cervix spread rapidly to the glands, while cancer of the upper cervix and the body extend slowly. In these cases extirpation of the neck and body are sufficient; but in involvement about the os as much tissue as possible must be removed to effect a cure.

Abdominal Hysterotomy for Chronic Uterine Inversion.—F. W.

N. Haultain (*Proc. Royal Soc. Med.*, July, 1908) records three cases successfully treated in the following manner: Median abdominal incision. The inverted fundus is seen as a narrow transverse slit; into this a dressing forceps is passed and opened as widely as possible to break any peritoneal adhesions in the inversion funnel (these were found in two cases). Each round ligament, as it passes into the slit, is now seized by a pair of Kocher forceps and pulled upward and forward, while at the same time an assistant pushes the fundus uteri upward from the vagina. By this means a thick ring, formed by the uterine walls, is seen surrounding the slit formed by the inverted uterus. This ring is divided posteriorly, the incision passing through the entire thickness of the uterine wall. By this means partial reduction is obtained by the vaginal taxis, and the still constricting portion of the uterus exposed; through this the incision is continued until a sufficient opening is formed to permit of the introduction of the forefinger to below the fundus, after which firm, regulated pressure can be exercised upon it and reduction easily secured. An incision in the posterior uterine wall, a little over $1\frac{1}{2}$ inches in length, is now left, which can readily be united by two or three deep sutures of silk or chromic gut, covered by a superficial Lembert of catgut. For posterior abdominal hysterotomy the following advantages may be claimed: 1. Absolute simplicity of the operation, fifteen to twenty minutes being ample for its performance; 2. Small uterine incision; 3. Easy control of hemorrhage, should it occur, which is the exception; 4. No subsequent displacement of uterus; 5. So far as my three cases can show, uneventful recovery and subsequent uncomplicated pregnancy in two out of three cases. For chronic inversion of the uterus the writer unhesitatingly recommends abdominal hysterotomy without any attempt at taxis, immediate or steady elastic, which, from its irksome nature, uncertainty, predisposition to bleeding, and even dangerous results of pressure, seems more risky than opening the abdomen, which practically represents the whole danger of the operation described; while the main advantages over the vaginal operations are greater simplicity, avoidance of hemorrhage, and, should it occur, its ready control.

Transplantation of Ovaries.—F. H. Luartin (*Surg., Gyn., Obst.*, July, 1908) discusses his own work in this line and reviews that of others. He concludes that homo- or hetero-plastic transplantation of the ovaries in women, or in lower animals, is no more dangerous if accomplished aseptically than any other small plastic operation on the appendages. Homo-transplantation will prevent the atrophy of the genitalia which usually follows castration. It is not yet satisfactorily demonstrated that hetero-transplantation of the ovaries in a considerable number of cases will give permanent relief from the nervous symptoms produced by the menopause or prevent atrophy of the genitalia otherwise following castration. In women, or in

lower animals, it may prevent the atrophy of the genitalia which usually follows castration. Transplantation of ovaries from one species into another may result in preventing the ordinary changes in the genitalia resulting from castration. Menstruation will continue in women and monkeys after homo-plastic transplantation of ovaries. Conception has followed both homo-transplantation and hetero-transplantation in animals. It has followed homo-transplantation and has been reported following hetero-transplantation of the ovaries in women. Hetero-transplantation of the ovaries should be accomplished as soon after the primary operation in which the receptor's ovaries have been sacrificed as possible, before the menopause has become established and the genitalia atrophied. Transplanted ovaries in other localities than the normal will maintain their vitality, functionate, and prevent ordinary sequelæ of castration.

Perineorrhaphy for Complete Laceration.—T. J. Watkins (*Surg., Gyn., Obst.*, July, 1908) describes an operation for complete laceration of the perineum for which he claims these advantages: 1. The external sutures are all distant one-half inch or more from the anus and consequently minimize the danger of infection. 2. There is no constriction of the skin and connective tissue about the anus. 3. Individual suture of the muscle. 4. Absence of any danger of a recto-vaginal fistula as a result of the operation. 5. A relatively small amount of suffering following the operation. 6. Enemas can be used in the postoperative treatment without the usual danger of injury or infection. The technic is as follows: A transverse vaginal incision one-half to one inch long is made through the vaginal mucosa, at least half an inch beyond the uppermost part of the rectal tear. The higher up the incision the greater the security against infection. When there is not much injury to the rectal wall the incision may be made at least one inch above the rectal opening. A sharp-pointed straight scissors is pushed under the vaginal mucosa from the incision down to the retracted end of the sphincter ani muscle on one side, and the blades are opened so as to freely separate the tissues. Blunt dissection with the scissors is done in like manner on the other side. The connective tissue, between the two canals made by the scissors, is separated by blunt dissection or by incision down to the rectal wall. The end of the muscle is now caught on either side with a Pean or rat tooth tissue forceps and drawn into view. The two ends of the muscle are sutured with No. 1 chromicized catgut. The suture should be carried through the muscle and surrounding connective tissue two or three times and then tied (using only one knot). When the suture is completed the muscle is allowed to drop down to the bottom of the incision. A test of good approximation of the muscle is a restoration of the corrugations of the skin that normally surround the anus. The remainder of the operation is the same as for relaxation of the vaginal outlet, and may be done by an Emmet or Hegar operation.

Gynecological Massage in the Treatment of Plastic Infiltrations and Pelvic Exudates.—M. Bourcart (*Ann. de Gyn. et d'Obst.*, August, 1908) believes that massage in gynecology gives excellent results if used with prudence and proper technic. It may be combined with other medical measures, and may be preparatory to surgical procedures. Its use externally will influence the circulation, acting upon inflammation, resorption and assimilation. Bimanual internal massage has a mechanical value, and should never be applied in acute or subacute cases, but in chronic cases in which all inflammation has ceased. Bimanual massage of the ovaries should rarely be used. In such cases massage should be abdominal, and if its results are not curative the patient should be operated on. It enables many cases to be cured without surgery and when necessary gradually prepares the ground for the surgeon. By its influence on the circulation infections of the organs and tissues of the pelvis may be arrested, localized and made to disappear, and it may suppress both the cause of the inflammation and its effects on the organs. The action of vibratory massage is antitoxic; it improves the abdominal circulation and aids in the destruction of bacteria, while it facilitates the elimination of their products, and favors repair. Its effect is shown by the increase in the amplitude of the pulse; it causes diuresis, produces a sensation of thirst in a few minutes, lessens abdominal pain, lowers fever when there is not a large collection of pus present, arrests infection, and favors encystment of pus. Vibration sets in action the phagocytosis and favors the work of the viscera in neutralizing and eliminating poisons. In acute cases only the mildest vibratory movements are to be used over the abdomen and subhepatic region, and they should be begun at the earliest possible moment. In chronic cases the manipulations should be equally careful, and may include bimanual internal treatment. The patient should feel no pain or inconvenience. Exudates and adhesions are rapidly absorbed and elasticity brought back.

Uterine Endoscope.—Ch. David (*Ann. de Gyn. et d'Obst.*, September, 1908) describes the uterine endoscope as consisting of an outer tube with an obturator, inclosing another tube with a glass disk closing its inner end, and an apparatus for lighting it consisting of two small electric lights, which have no heat-producing power. The tubes are modified for use in smaller and larger uteri, in the puerperal state and after abortions. The endoscope should be used only after a complete gynecological exploration of the patient. The patient is prepared as for a capital operation, by disinfection, shaving and washing. The uterus is generally open enough to introduce the tube without dilatation, but when this is not the case a laminaria tent may be inserted the night before. This dilatation has a very good effect on metrorrhagia, causing it to stop in many cases. Anesthesia is not necessary. When there is a marked hemorrhage, adrenalin may be used on an intra-uterine tampon. The instrument is introduced with the patient

on her back, and the maneuver can be done at her home if desirable. If there is any marked displacement of the uterus so that the tube cannot be easily introduced, it should never be used. When the tube reaches the fundus, and the inner tube and light are in place, a view of the fundus is first obtained. By inclining the tube to left and right, forward and backward, all parts of the fundus may be seen, the uterine horns examined, and by withdrawing it the walls of the cavity may be seen. Occasionally it is found better to make the examination in the knee-elbow position. The examination is followed by an intrauterine irrigation. There are no inconveniences due to the examination, no pain, and when conducted aseptically no danger of infection. Contraindications are pregnancy, inflammation of the periuterine tissues and irreducible deviations of the uterus. Indications are metrorrhagia, chronic metritis, intrauterine tumors, cancer of the uterus, foreign bodies and deformities of the uterus. After labor, it may be used to determine retention of the placenta, uterine infection and rupture of the uterus; after abortion, to detect placental retention and traumatic lesions. In the normal woman the uterine mucous membrane is of a very pale rose color, uniform throughout, and its surface is absolutely smooth. In metritis the color is deeper, and veins in tree forms are seen. In chronic endometritis the changes are few, unless there are vegetations or ulcerations. Villosities, fungosities, mucous polypi and cysts may be seen. Visible tumors include polypi, small fibromata and cancer in the villous and polypoid forms. Débris and retained clots have a dark, purplish color. In puerperal infection the color is a grayish-white. Perforations may be located after abortion. Curettage may be done with the tube in place, allowing the operator to see what he is doing. Applications may also be made to the lining of the uterus. Uterine endoscopy seems to be a procedure that is of great value in diagnosis and treatment, and is without any bad results. The author advocates its frequent use by the physician.

Early Rising After Laparotomy.—Franz Cohn (*Cent. f. Gyn.*, September 19, 1908) gives his experience at the hospital at Kiel in allowing patients to get up in from one day to a week after laparotomies. He finds the patients much pleased with the change and their mental condition much improved. All the functions of the body go on better. The inability to urinate in the prone position is obviated, and the passage of flatus and the movements of the bowel are much easier. The appetite is improved and the general condition is much better than under the old system of keeping the patients in bed for three weeks. The patients do not dread the operation as they formerly did. No stretching or thinning of the cicatrix was seen in any case. In a series of one hundred laparotomies, all of whom got up within the first week, no bad results were seen. Three patients had thrombosis of the veins of the thigh. No pulmonary embolisms occurred and no cases of pneumonia. The cases in which there was fever or anemia before operation were not allowed up so soon.

DEPARTMENT OF PEDIATRICS.

ORIGINAL COMMUNICATIONS.

RHEUMATISM IN CHILDREN.*

(SYMPOSIUM.)

GENERAL CONSIDERATIONS.

BY

LEGRAND KERR, M. D.,

Professor of Diseases of Children in the Brooklyn Post-Graduate Medical School; Visiting
Pediatrist to Methodist-Episcopal, Williamsburgh, and Swedish Hospitals, Brooklyn.

UNDER this heading of "general considerations," the writer will not attempt to completely cover the subjects taken up, but the aim will be to arouse some discussion which will prove of practical advantage to those who discuss and those who listen.

The subject of acute rheumatism in children brings into the foreground several interesting and practical questions to which there are apparently no well-defined or entirely satisfactory answers.

Each side has its adherents; and it might be asked, of what advantage is the championing of either side if some definite solution cannot be reached? But such a discussion cannot fail to draw attention to certain phases of the subject which are too often neglected and, if free and unbiased, might result in a clearer and more impartial appreciation of the varied aspects which such questions may present.

Until recent years the occurrence of acute rheumatism was considered somewhat rare in children, while at the present time it is freely acknowledged that the disease shows its most varied and complete manifestation in children.

The suggestion has been made that this change of view was due to the fact that acute rheumatism in former times was considered as a disease distinctly of the joints. This suggestion is not correct, however, for many of the older writers described the affection of various organs *without* joint symptoms and, what is more convincing, are the repeated statements of such writers that visceral involvement may and frequently does precede the

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joint involvement. The occurrence of rheumatic fever without the existence of an arthritis was recognized long ago and the relationship between chorea and rheumatism is at least three-quarters of a century old in medical literature.

Surely there has been no marked change which has taken place in the distribution of acute rheumatism; and yet, why was our more recent attitude toward the age incidence of the disease not spread abroad at a more remote date?

Can the solution be found in bacteriology? Several investigators have described diplococci which have been recovered at autopsy from the heart's blood, the endocardial vegetations, pleural and pericardial exudates and synovial membranes of the joints in cases of rheumatic fever. These are not distinguishable morphologically or by culture as peculiar, although certain men have claimed that inoculations from such cultures produced various lesions, such as multiple neuritis, endocarditis, pericarditis and pleurisy.

Cole, however, showed conclusively that these results were common as the result of inoculation by streptococci from various sources. At the present time there seems to be no convincing proof that these diplococci are specific bacteria or the cause of a specific disease.

It would seem that the only answer to the question is in the closer study of the child, which is a product of recent years. As a result of that study we are now cognizant of the fact that rheumatism as it affects the young child is an entirely different proposition from the same disease in adult life. I believe that we should be more cautious or exact in the use of terms and speak of the disease in children as acute rheumatism, as in them it is an acute infectious process, while in adults it is not so much an infection as a faulty metabolism and deficient elimination of certain products.

Why does the clinical picture differ so markedly from that of the same disease in the adult?

That there is a conspicuous difference there can be no dispute, for there is no disease in which the clinical aspects are so widely different in childhood and adult life.

It is easy to satisfy one's doubts with the idea that the child possesses certain tissues which are more susceptible, and other tissues that are more resistant to the rheumatic poison than corresponding parts and organs in the adult. But such an explanation is not satisfactory. It is now a well-recognized fact that in

acute rheumatism in children the joints largely escape the ravages of the disease. And this is more remarkable when we recognize that during this same period of life the joints are very commonly the site of other infective processes. On similar lines of argument, the occurrence of chorea as a rheumatic symptom is often presented as a demonstration of the severity with which the nervous system suffers in early life from the pernicious influence of acute rheumatism. And yet the most acute and intractable forms of chorea are *not* seen during early life, but in adolescents, and, further, one of the most marked effects of rheumatism on the nervous apparatus—elevation of temperature—is seldom met with in early life.

Such a question as this is well within the realm of our discussion and when some one can answer it we may be nearer a solution of the problem of acute rheumatism.

A large share of our interest should center upon the possibility of making an early diagnosis. That much must be admitted, for without an early diagnosis incalculable damage may be done. The chief object of the early recognition is the prevention of cardio-vascular changes.

In approaching the subject we must leave behind us all preconceived ideas and deductions which we have acquired from an experience with the study of adult cases, for acute rheumatism in the child is entirely different in all of its clinical aspects from the same disease in adult life.

A rheumatic arthritis *per se* has little to do with the cardiac changes which occur in the child.

Irreparable damage is often done to the heart without any evidences of an arthritis or, in fact, any of the usually recognized so-called symptoms of rheumatism, with the possible exception of "so-called" growing pains, leg cramps, iritis, myalgia, tonsillitis or chorea.

Arthritis, strictly speaking, is not the cause of the cardio-vascular changes—the diathesis which causes the one, induces the other.

The earliest possible recognition of the existence of acute rheumatism in the young child is offered by a correct estimation of the functional capacity of the heart, for in no other condition is functional perversion so constant.

There are several methods of testing the functional capacity of the heart, and one of the best is Herz's arm-flexion test. In this the elbow is supported by the hand, and with the free

hand the wrist of the patient is grasped and the child instructed to make a slow uniform flexion of the forearm, and this is not to be resisted by the examiner. Following flexion, there must be an equally slow and deliberate extension. Throughout the whole motion the child must concentrate his attention closely upon the act. The previously counted pulse is then retaken, and if the myocardium is not absolutely normal and sound, a very noticeable difference is at once noted. There is a slowing of the pulse rate, but an increase in the size and strength of the pulse wave.

My method has been to give the child a small dose of digitalis tincture (one minim to a child of seven years) and note the effect on the pulse. If there is an appreciable difference in the rate or quality of the pulse under conditions similar to those which preceded the ingestion of that dose, it is suggestive of functional perversion.

I would emphasize the importance of the cardio-vascular changes because of their frequency. Their influence upon the course and outcome of the disease is so marked at times it might almost leave one in doubt as to whether or not they should be considered as the typical characteristics of the disease.

Still, it is not simply by the prominence of one or more particular symptoms that the disease is recognized, but by the combination or association of a number of such which are apparently unrelated. An illness which has an abrupt onset with slight fever, but with general symptoms which are for the most part indefinite, is strongly suggestive of rheumatism.

The family history is very important, for the influence of heredity is strong and a child of a rheumatic parent is very liable to develop the disease; and if both parents are affected, then the liability is almost a certainty.

The history of the previous condition must take recognition of the existence of indefinite muscular pains, joint stiffness, articular swellings, the previous occurrence of attacks of tonsillitis, chorea, torticollis and frequent erythemas. Repeated attacks of bronchitis, otherwise unaccounted for, are at once suggestive of a rheumatic origin. When the suspicion is once aroused that there is a rheumatic tendency in the child, any symptoms which arise and are not definitely explained should at least suggest the possibility of acute rheumatism.

RHEUMATISM IN CHILDREN.*

(SYMPOSIUM.)

DOES THE REMOVAL OF HYPERTROPHIED TONSILS AND
ADENOIDS REMOVE A SOURCE OF INFECTION?

BY

LEFFERTS A. MCCLELLAND, M. D.,

Professor of Diseases of the Ear, Nose and Throat in the Brooklyn Post-Graduate Medical School; Surgeon, Ear, Nose and Throat Department, Williamsburgh Hospital; Consulting Otologist and Laryngologist to the German Home and Hospital, etc.

THE assignment of that portion of the symposium on Rheumatism which relates to a consideration of the influence which the tonsillar ring bears to this peculiar complex disease suggests culling from medical literature some of the experiences and views of many noted clinicians that the aggregate of their opinions may help to guide me in the interpretation of my own clinical pictures.

The name Rheumatic Angina is first met in the writings of Stoll in 1777. Whatever may be the theoretical aspect of the subject, it is a well-known fact that after exposure to wet and cold many susceptible persons suffer an attack of tonsillitis followed by rheumatic symptoms, either vague, *e.g.*, the myalgic, or the well-defined articular variety. The frequency of this correlation has been noticed by numbers of observers. The late Sir Moreil Mackenzie and E. Fletcher Ingals agree that rheumatic individuals are most liable to tonsillitis. Dr. Lewellys Barker, of Johns Hopkins University, very recently read an essay before the County Society of Kings emphasizing the relationship between tonsillar infections and rheumatism, and he cited his own serious invalidism from the latter disease, which failed of cure until his tonsils had been removed. Niemeyer, Ziemssen, Aitken, Bosworth, Flint, Loomis and Bartholow all agree that there is a hereditary predisposition to quinsy and a tendency in those affected to recurrent attacks.

J. Langdon Knox, in reference to the above-expressed opinions, says: "I take it that the diathesis creates the susceptibility to and shapes the course of the disease. Grant this and quinsy becomes a rheumatic inflammation and should be treated accordingly."

Haig Brown, of Leeds, says: "Tonsillitis and rheumatism

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each is liable to follow the causes, *e.g.*, weather, humidity, etc. In 119 cases of tonsillitis which he tabulated, thirty-eight had previous attacks of rheumatism. In twenty-eight, rheumatic pains accompanied the tonsillitis. Ten never had had rheumatic arthritis, but one or other of their parents had suffered from the disease."

The frequent recurrences of the attacks of both disorders and the cardiac murmurs of more than transitory influence so often developed in the course of tonsillitis, are features showing a relationship between rheumatism and tonsillitis.

Dr. Cheadle has commented on the frequency of the absence of a defined cause, especially in young children, for many cases of valvular disease of the heart, while the author calls attention to the frequency of the diagnosis of "febricula" for want of an examination of the throat whereby the cause of illness would have been demonstrated.

I have believed and taught for some time that endocarditis may accompany follicular tonsillitis.

Dr. Haig Brown also reports "two cases of tonsillitis each complicated with endocarditis associated with hyperpyrexia sometimes met with in rheumatic fever. It differed from rheumatic hyperpyrexia in that neither case terminated fatally, but agreed with it in that both the hearts were permanently damaged."

Archibald Garrod, of London, has said, "It is difficult to discuss rheumatism and tonsillitis without considering rheumatic pharyngitis with which it is often associated."

Lasegue calls attention to the injection and swelling of the pharynx, uvula and palate, but although he agrees that the tonsils may become involved, he believes that this is only by extension of the inflammation and that they are not primarily attacked. Trousseau, Fernet, Besuier and other authors have laid much stress on the great pain which attends the act of swallowing in cases of rheumatic sore throat, which is certainly in some cases out of all proportion to the apparent inflammation, and may perhaps arise from the complication of the pharyngeal muscles.

From Haverian Lectures, 1889, a case is cited of a boy aged six years, who developed a cardiac murmur during a case of tonsillitis.

The Collective Investigation Committee (*Brooklyn Med. Jour.* 1888) has the following report: "Tonsillitis when it was noted as an antecedent of rheumatism in the great majority of cases preceded it by a less interval than twelve months."

Again, Cheadle says, "Tonsillitis may occur at any period of the rheumatic series, although it most often comes first, immediately preceding arthritis."

Again, he says, "Both pharyngitis and tonsillitis occur so frequently in direct association with unequivocal rheumatic lesions that they must be assigned places among the manifestations of the rheumatic state, for how else can we explain the extreme frequency of the initial sore throat of rheumatism, or how shall we separate tonsillitis from the other rheumatic events of childhood?"

Undoubtedly there are many cases of sore throat and even of tonsillitis which bear no relation to rheumatism. Among some of the conclusions formulated by Dr. Cheadle, are:

1. Both tonsillitis and pharyngitis are sometimes manifestations of rheumatism.
2. Some evidence pointing to rheumatic origin is obtained in about one-third of the cases which come under treatment for sore throat of either variety.
3. It is possible that rheumatism may occur as a complication of infectious sore throat, just as it frequently occurs as a complication of scarlatina, but it is probable that in many cases apparently of this kind the throat affection is really abortive scarlatina.
4. True articular pains occurring in association with sore throat afford evidence of rheumatic origin.
5. When sore throat is the leading feature of the attack, there is comparatively little tendency to affections of the endocardium or pericardium.

Dr. Hanau Loeb, in his opening address as Chairman of the Section of Laryngology and Otology of the A. M. A., held this year in Chicago, said: "The throat is seen to be a factor in some of the most serious affections, among the most important of which are rheumatism, tuberculosis, meningitis and endocarditis. Although final evidence is wanting, it is within the range of positive probability that many of the more general conditions have their origin in a bacterial invasion through the tonsil." Quoting again the same authority: "Quite recently Wood was able, by rubbing a virulent culture of bovine tubercle bacilli on the surface of the tonsil of hogs, to inoculate the tonsil, and he succeeded in finding the tubercle bacilli in the regional lymph glands of the neck within five days after inoculation." Again, he says, "It would seem very strange if the warm, moist character

of the adenoid masses did not provide a highly satisfactory medium for bacterial growth."

Shurly, under Acute Follicular Tonsillitis in his book on Diseases of the Throat, says: "It is the opinion of many writers that rheumatism is an important predisposing cause in many cases. While it cannot be denied that rheumatism is probably an etiologic factor in some cases, yet its importance in this direction has undoubtedly been very much overestimated. Whether rheumatism is considered one of the infectious diseases (due to a microorganism) or simply a hemic disease depending upon irregularities of metabolism, it has only an accidental relation, from a clinical point of view, with acute follicular tonsillitis." Lennox Brown said: "Some consider that the joint is affected from the throat in a reflex manner from an irritation of the vasomotor nerves; others trace both affections back to infection and consider that rheumatic pains are pyemic. Some who favor a gouty association think that the principal factor is a faulty digestion of metabolism, the blood being charged with a greater number of fatigue products." But the probably correct explanation was that of Dr. Andrew Clark, who said: "If one will think merely of the rapidity with which the tonsil manufactures and discharges lymph-cells, it will not be difficult to see how a sudden suppression of this process, the accumulation of effete matter in the crypts and the filling up the lymph spaces with products of bacterial life and with matters undergoing evolution may contaminate the blood and originate the troubles considered as rheumatic."

The structure and placement of the tonsillar crypts favor the collection and maceration of the various products of food, epithelium and bacteria. Especially in buried tonsils is retained material likely to be found in the supra- and infratonsillar regions. Retention of cryptal débris is prone to cause an excoriation within the walls of the crypts resulting in a desquamation of epithelium, thus opening an avenue for the liberation of the confined pathological entities which may travel along the lymphatics dealing out the poison from the condensed nastiness which had heretofore been retained within the walls of the crypts.

Previous inflammations tend to seal the mouths of the crypts, as does an expansive plica triangularis and redundant plica supratonsillaris. Consequently in the treatment of such cases care should be taken to eliminate every vestige of covered cryptal tonsil tissue found, and this means total ablation.

Answering the query, "Does the removal of tonsils and adenoids remove a source of infection?" you will note the question specifies a source, and to this, after careful study, I am convinced that the answer must be yes.

78 McDONOUGH STREET, BROOKLYN, N. Y.

RHEUMATISM IN CHILDREN.*

(SYMPOSIUM.)

TREATMENT OF RHEUMATISM IN CHILDREN.

BY

JOHN R. STIVERS, M. D.,

Visiting Physician to the Kings County and Samaritan Hospitals; Adjunct Professor of Medicine at the Brooklyn Post Graduate Medical School, etc.

IN considering the treatment of rheumatism we should bear in mind that the chief importance of the disease is the tendency to produce cardiac complications and that cardiac involvement is so frequent and so serious in its consequences that every possible effort should be made to avoid the disease in those who are predisposed to it by heredity. It is of almost equal importance to try to prevent a recurrence in those who have once had an attack. In every case our aim should be to prevent the heart from becoming affected.

There is some difference of opinion in regard to the kind of diet that is most likely to produce rheumatism, but it is without doubt a fact that rheumatic children do better on a nitrogenous diet than on a starchy diet. Milk should be the foundation for the nourishment in all cases.

Rheumatic children should wear woolen underclothing during the entire year, but not necessarily of heavy weight. The practice of dressing young children in socks and sandals, leaving their knees and legs exposed, should be most emphatically condemned. Exposure to damp weather and to sudden changes of temperature should be guarded against and the feet always kept dry.

Every child with rheumatic pains, no matter how slight, should be kept strictly confined to the house, and if there be any elevation of temperature, even if not more than 99° or 100° F., the child should be placed absolutely at rest in bed and remain there until all rheumatic symptoms have disappeared. This rule should be rigidly enforced to prevent involvement of the endocardium. We should be on the alert from the very beginning of an attack for cardiac symptoms. It not infrequently happens that the

* Read before the Long Island Medical Society, October 6, 1908.

endocardium is affected before the true nature of the disease is determined, particularly in cases where the joint symptoms are not prominent.

The foregoing remarks include what may be termed prophylactic treatment.

In regard to the use of drugs to combat this disease, the salicylates undoubtedly claim first place. The salicylate of soda may be given in fairly large doses with comparative safety; a child three years of age, for instance, may be given from 2 to 6 grains every three hours and this dosage continued for two or three days. If no improvement is noticed after three days, this drug should be discontinued. If improvement follows, the drug may be continued in smaller doses for a considerable time longer. It is always well to administer an alkali, preferably the bicarbonate of soda or potash, with the salicylate in sufficient quantity to produce alkalinity of the urine. At the first sign of inflammation of the endocardium, an ice-bag or counterirritant should be applied to the precordia. Anemic children should receive iron, either the syrup of the iodide or tincture of the chloride.

Inflamed joints should be wrapped in cotton after a soothing application, such as oil of gaultheria or chloroform liniment has been applied. An application of collodion to which has been added iodoform, in the proportion of one dram to the ounce of collodion, makes a comforting dressing and may be productive of some good by reason of the absorption of the iodine.

The administration of potassium iodide, five to ten grains per day, with wine of colchicum sufficient to produce looseness of the bowels produces good effect in the subacute or chronic cases.

The alkaline treatment as recommended by Fuller has many advocates. It consists in giving bicarbonate of soda one and a half drams, citrate of potash a half dram, citric acid a half dram, and three ounces of water. This forms an effervescent drink.

We know that in most rheumatic cases the alkalinity of the blood is diminished and the acidity of the urine is increased, and by the administration of alkalies we supply that which is deficient in the blood and by elimination neutralize the urine.

In conclusion I would emphasize the necessity of keeping rheumatic children at rest in bed and would advocate the prompt, heroic and persistent treatment, both curative and prophylactic.

TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

(Continued from November.)

THE NEED OF POSTGRADUATE INSTRUCTION IN PEDIATRICS.

DR. AUGUSTUS CAILLE, of New York, read this paper. He said that during twenty years as a teacher in pediatrics he had not met a single young hospital graduate, other than ex-internes of children's hospitals, who on inquiry did not admit his lack of knowledge regarding the line of professional work which made up one-half the practice of the family physician. It was, therefore, evident, that the present facilities for acquiring the knowledge necessary to combat preventable infantile sickness and mortality were wholly inadequate and that more practical instruction along the line indicated was urgently needed. The value of a postgraduate course lay in the fact that under the guidance of competent teachers one may first see the patient in the dispensary, then in the hospital ward where medical or specialistic or operative treatment was carried out in detail. The broadening influence of pediatric study had not been sufficiently emphasized and it was probably under-rated.

MODERN LABORATORY FEEDING AND THE WIDE RANGE OF RESOURCES WHICH IT PROVIDES.

DR. THOMAS MORGAN ROTCH, of Boston, wished to place before the profession the result of his seventeen years' study in modern laboratory methods. He pointed out that the resources of the milk laboratories were such that physicians could prescribe combinations of any known food-stuffs. Following out this idea he explained that it was no longer necessary to feed an infant with a patent or proprietary food because that food had seemed to agree best with an individual with a weak digestion. He stated that careful chemical analysis had now made us familiar with the food constituents of all the patent and proprietary foods. Therefore, it was now possible to make exactly the same combinations as appeared in these patent foods at the laboratories. The prescription for these compounds of food could be written in percentages. He pointed out that each of the advances which had been made in the combination of the ingredients of the various food-stuffs had really emanated from the chemist in charge of the milk laboratories. Of special importance, next to the work of separated proteids, whey and casein, which now for some years had been obtained from the laboratories, was the possibility of prescribing the carbohydrates to a much wider extent than ever before. He explained why and how maltose was preferably used instead of lactose in cases where there was overproduction of lactic acid, and how, on the contrary, where

there was an overproduction of butyric acid, lactose was preferable to maltose. He showed how it really was not necessary to make use of the mechanical action of the starches in making the casein precipitate finer, since the divided proteid accomplished this much better and much more intelligently. He explained also how the supposed value of a well-known patent food, whose chief ingredient was maltose, could be obtained on a laboratory prescription by simply prescribing dextrinized starch, and thus obtaining besides maltose a residue which corresponded to that in the above mentioned food, in both cases the residue being what was claimed for the food regarding its laxative properties. He stated that it was a mistake to think that centrifugal cream must necessarily be used in laboratory prescriptions, and that, on the contrary, the laboratory was always willing to make up the prescribed fat combinations from gravity cream when called for by the prescribing physician.

One of the greatest advances which had been made this last year in regard to the possibilities of laboratory modifications on physician's prescriptions, when wishing to use laboratory method, was the use of lactic acid or the lactic-acid bacillus in pure culture. He said that it was well known that there were a great many different strains of the lactic-acid bacillus, some good and some inferior; but a strain had now been obtained and was kept at the laboratories which was seemingly successful in killing out the special ferment which produced the fermentative diarrheas, the so-called fermentative indigestion type. The physician could now prescribe a pure culture of lactic-acid bacillus in every case of this kind and its use had been followed by the greatest success. He also showed how, by simply prescribing a certain percentage of lactic acid, this degree of acidity could be used for purposes of digestion without necessarily allowing the process to go further.

Dr. Rotch finally stated that what he had attempted to do was to prepare a prescription card which could be used by the profession at large; that this prescription card could be used for prescribing any combination of food-stuffs, and any of the ingredients in the required percentages. This prescription card would have on one side of it explanatory notes showing exactly the percentages of the various food-stuffs, fats, carbohydrates and proteids, thus enabling the physician to see at once what percentage of the different combinations should be used.

He expressed his appreciation of the information he had obtained from Professor Howe of the State Normal School in connection with all the good work which had lately been done under his supervision at the Walker-Gorden laboratories.

The prescription blank represented on one side an explanation of why each of the several compounds which could be obtained in the laboratory was used; the name of the compound came in the next column, for instance, fat, lactose, maltose, lactic-acid bacillus, etc., and then came percentage columns on the other side again, in which the definite figures could be placed.

Tuesday-afternoon Session.

DISCUSSION

DR. L. EMMETT HOLT regretted that a paper which was in the course of preparation by Dr. Clarke and himself was not in readiness for this meeting. It was along the lines suggested by Dr. Rotch's paper. One experiment was to determine the effect of lime-water upon the gastric secretion. He used plain milk diluted with water, with lime water and with soda. The chief effect of the lime-water seemed to be to increase the amount of hydrochloric acid. There had never been found a deficiency of pepsin in the infant's stomach, but there had been a great variation in the amount of HCl. The stomach-contents were removed a half-hour after the child was fed and the fluids set aside in a thermostat to see what further digestion would take place. He found that the process came to a rest but that if more HCl were added it would go on until complete proteid digestion had taken place. This showed that the problem was to increase the secretion of HCl. The results of the experiment seemed to indicate that the chief function of the lime-water was to stimulate the secretion of HCl.

DR. HENRY D. CHAPIN had written several papers with the same object, as he recognized that in many cases proprietary foods did good and he wished to see if they could be utilized in a scientific way. Many of these foods were good not only as diluents but had nutritional value as well and this made him believe that the whole subject of infant feeding ought to be approached from the biological standpoint rather than from the chemical. One must understand the intestinal tract of various animals; milks are not interchangeable in any sense. They have a double function; a developmental function as well as a nutritional one. Hitherto the developmental function has been ignored.

DR. AUGUSTUS CAILLE said that the subject was difficult because if we took a test-tube and placed in it water, nitrate of silver and chloride of sodium, the chemist would know the end-results. Suppose the gastroenteric canal to be a second tube; place in it your food, milk, fat and salts; but here the secretions were not always the same, and secretions in motion were not like secretions at rest. No one could foretell the end-results in the second case. Now again assume the gastrointestinal tract to be infested with bacteria and who could tell the end-results.

DR. J. P. CROZER GRIFFITH was a believer in scientific feeding, but he sometimes wondered if we were not blind leaders of the blind. One problem that had come to him was how they could teach this subject so as to make the average student understand it. He wondered if one presented them with any very elaborate scheme for laboratory feeding whether they would not become discouraged and abandon it. He did not wish to say any thing to discourage them and it was a matter not so much for them as for their pupils who were turned out to practise in country places and elsewhere.

DR. WILLIAM P. NORTHRUP said that one ingredient had scarcely been mentioned and that was milk. One of the great triumphs of the laboratory was pure milk with a known fat-content of unvarying degree.

DR. THOMAS MORGAN ROTCH, closing the discussion, said that the way in which the Society had discussed the paper showed that they were interested and that all were working in the same direction. The improvement in the milk-supply had been wonderful. There was no question but that Dr. Chapin was right. As to Dr. Griffith's pessimism, he said that we were not working for students, but were trying to learn the best instruments to work with just as one would try surgical instruments. He thought Dr. Southworth's teaching on alkalinity was the most advanced. Dr. Dunn could show case after case where lactic-acid feeding had not been unavailing; they had done better than any set of cases they had had. He was not aiming at the biological part of the question; that was not his line of study. When Dr. Caille said only a few persons knew how to use these methods of feeding he was mistaken. There were many men who were using them. He did not think any one should throw cold water on these investigations. We were beginning to understand why human milk was better than modified milk, but over and over again we could not get it, and we endeavored then to get the best modification that we could.

DR. A. JACOBI did not understand the difference that had been claimed for chemistry and biology. If there were such a boundary line we would not be in a position to study biological chemistry. He did not recognize any such boundary line and did not think that Dr. Chapin was justified from that point of view in bringing up that issue. Biology could not exist without chemistry.

DR. HENRY D. CHAPIN did not intend to put biology against chemistry but to protest against putting a chemical value on foods to the exclusion of their biologic value.

DR. JACOBI, said we should not forget that all could not work in the same line. There were a few who could do original work but most of us had only critical minds.

THE HARD CURDS OF INFANT STOOLS; THEIR ORIGIN, NATURE, AND TRANSFORMATION.

DRS. THOMAS S. SOUTHWORTH and O. M. SCHLOSS, of New York, presented this communication. The discovery that firm rounded curds occurring not infrequently in the stools of infants fed upon cow's milk were composed in part of fatty acids and soaps, had led to considerable discussion and warranted a further inquiry into the origin of such bodies in the digestive tract, and their subsequent transformation during their passage through the digestive tract. It was not an uncommon experience to find in the vomited matter in those with disturbed digestion, when upon a milk diet, large, firm, rounded and somewhat

elongated masses of rubbery consistency, which were assumed to be the result of the coagulation of cow's milk under abnormal stomachic conditions. It was inconceivable that these vomited masses had been formed anywhere else than in the stomach and they corresponded, moreover, very closely in appearance to the curds which may be formed from cow's milk by the addition of rennet-pepsin and acid, heating the mixture to the body temperature and, when the whole had coagulated, pressing the coagulum so as to thoroughly expel the whey. Such masses formed artificially no one certainly would hesitate to call a curd; and the conditions which were necessary for the formation of the cheesy milk curd may also be present in an infant's stomach, especially during those types of disturbed digestion which increase the amount of abnormal acids. The only real difference between the factors in the commercial and physiological production of curds lay in the fact that while lactic acid was chiefly present in the commercial process, hydrochloric acid, butyric acid, acetic acid, and other acids may also play a part in the stomach.

To understand the subsequent changes in these curds, if formed in the stomach of an infant, it was important to keep in mind the fact that all milk curds included both fat and paracasein. If curdling took place in large and compact masses they frequently could not be disintegrated in the stomach; when not disintegrated in the stomach these masses must, unless vomited, pass on into the intestine where they were subjected to the further influence of an alkaline medium and to chemical and bacterial action. In the intestine the fats are split by ferments into glycerine and fatty acids and the latter, in an alkaline medium, may be more or less transformed into soluble or insoluble soaps, according to the nature of the base with which they combine. It had been recently advanced that the occurrence in the stools of such masses was an evidence of excessive fat in the infant's food. The production of excessive quantities of abnormal acids when there is fat indigestion makes a favorable condition for the formation of large curds. Furthermore, the larger the amount of fat in the milk-food, the larger the fat inclusion in the proteid coagulum, the larger will be the masses formed, and the less the probability that it can be disintegrated during its passage through the digestive tract, since the greater preponderance of fat would tend to weld it more firmly together. If further argument was needed to prove that the formation of these masses depended primarily upon the coagulation and curdling of paracasein, it would be found in the effect of efficient peptonization of milk, which transforms such portions of the casein as its action reaches into soluble and noncoagulable forms of proteid; this was one of the best recognized methods of causing the disappearance of such masses from the stools.

Although these theoretical and clinical grounds for considering such masses found in the stools to be identical in origin with

those found in the vomited matter seemed reasonable and conclusive, a series of observations and tests were instituted at the Nursery and Child's Hospital to definitely settle some disputed claims. Foremost among these was the claim that the masses in the stools contained no proteid and only fatty acids and soaps. Typically firm curds occurring in seventy-five (75) stools passed by thirty-eight (38) infants were subjected to qualitative chemical tests to determine the presence of proteid, soaps, fatty acids and neutral fat in those masses. Tests upon older children's stools, who were receiving whole milk together with other diet, had been excluded in the belief that the findings in young infants exclusively upon milk formulas would prove of greater interest. Tests were tabulated of fifty-one (51) stools of twenty-six (26) infants. The youngest were two months old; ten were from two to six weeks old; eleven from seven to thirteen months old; one was fifteen months, and two were three years old. The fat in the formulas fed varied from two to four per cent. In only five cases did it exceed three per cent. The proteid percentage ranged from 0.90 per cent. to four per cent. In but eight of these did the proteid exceed 2.50 per cent. and the majority of these were older infants fed upon plain milk diluted with barley gruel. Applying these qualitative methods to the firm masses, or hard curds, these bodies were found to consist mainly of fatty acids and protein in varying amounts, although they uniformly showed the presence of neutral fat by staining reactions. Insoluble soaps were found to be present, but apparently in smaller amounts than is usually assumed. In every instance the final residue of the masses responded to all four of the usual tests for protein. The hardness depended upon the relative amount of protein, soaps, fatty acids or neutral fat present. The softer masses consisted mainly of fatty acids or fat, while the harder masses contained a relative greater amount of protein. All masses, whether hard or soft, responded to the tests for protein.

It seemed apparent that the observations of others, that these typical masses contained considerable fatty acids, neutral fat and soaps had led to a hasty conclusion that the masses were simply aggregations of fat derivatives, and were not true curds. Such curds, whether rejected from the stomach by vomiting or passed through the intestines, must primarily be "milk curds" whose origin depended upon the formation of acid paracasein; the inclusion of fat was but an inevitable mechanical accident.

DISCUSSION.

DR. ISAAC A. ABT thought this a fertile field. Investigations from abroad led us to believe that there was no such thing as proteid indigestion, but that these troubles were due to fats. They say that curds in the stools are not formed of proteid but of fatty acids and soaps. He had fed babies, supposed to be suffering from fat indigestion on fat-free milk and found curds

in the stools that corresponded to the ones Dr. Southworth described. This surely was not fatty acid or soap, and must have been some undigested proteid.

DR. L. LOVETT MORSE said that his assistant had been at work on this subject; he had worked the thing out both qualitatively and quantitatively and found these large curds contained proteid in every case. The amount of fat present varied almost exactly with the amount given with the food, showing that the fat was merely caught in the meshes of the curd. He found the same thing to hold good in the artificial digestion of food. In the large curds he found the greater part of the fat to be in the form of neutral fat. He had found the small curds about the size of shot to be mostly soaps. The reaction of the stool depended upon the relation of fat and proteid in the original food. He also found these large curds in babies that were taking barley-water mixtures.

DR. S. MCC. HAMILL, of Philadelphia, said that he had given a child suffering from mild intestinal disturbance dextrinized food and within about three days the child began to pass curds very much like those Dr. Southworth had described. He then applied various dilutions of HCl to the food; first to the milk, then to the milk with dextrinized gruel and then to milk mixtures containing the gruel. He invariably got a curd that was practically indestructible. On stopping the gruel the curd disappeared. He decided that the gruel was the cause of the curd and that some defect in the gastric secretion was back of it. There were evidently conditions where the gruels defeated the object for which they were given.

DR. NORTHRUP asked Dr. Hamill if the feedings were 5 per cent. alkaline.

DR. HAMILL replied that they were.

DR. CHARLES G. KERLEY had used gruels for a long time but never had been able to give a higher percentage of proteids by their use. Consequently he only used them because of the additional nutriment that they afforded.

DR. THOMAS S. SOUTHWORTH, in closing the discussion, said that he thought it was largely due to the writings of Czerny and Keller that this doubt in regard to the composition of curds had arisen and he was glad to hear that Dr. Morse's investigations had substantiated his own and that it might be possible to correct this erroneous impression.

FAT AND THE PROTEID CONTENT OF TOP-MILK.

DR. CHARLES A. FIFE, of Philadelphia, read this paper. The Chapin dipper had been used in obtaining the top-milk and the results epitomized were shown by charts. The fats in the top ounces of the cream of quart-bottles showed great differences. In milks of lower grades the variation was less. In milks of higher grades the variation was greater. The proteids were very uniform throughout, but in the higher grades the propor-

tion of proteids was less than was usually believed, about 2.75 per cent. As to variations between the top-milks of pints and quarts, the quarts were more uniform, as a rule, than the pints and usually about one-half per cent. higher. With regard to the composition of the bottom-milk there was very little difference between the lower twenty-four ounces and the lower eight ounces, so that it was not necessary to depend on the lower eight ounces to get a so-called fat-free milk. There was very little difference as to proteid.

Wednesday-evening Session.

DISCUSSION.

DR. GRIFFITH said it was very perplexing to find out the top-milk's strength as it had a considerable variation. He had been using the lower eight ounces to get a fat-free milk and he was glad to find that this was not necessary.

DR. CHAPIN said that in his analysis he had found very little difference in the fat content of the top nine ounces. They varied but little from those of the writer of the paper. The error was reduced by dilution so that it did not amount to much. In assaying each ounce he had found quite a difference as one went down.

DR. SOUTHWORTH would like to suggest that the term "top-milk" should be limited so as to mean any mixture containing all the cream and a portion of the milk. That was the only way in which we could make a proper distinction between cream and top-milks.

DR. GREEN asked if any analyses had been made with the object of ascertaining the difference between the different layers of the under-milk. He used the so-called mid-milk for a fat-free milk. He had the idea that the under-milk gave denser proteid clot.

THE URINARY FINDINGS IN A SERIES OF INFANTS SUFFERING FROM INTESTINAL INFECTION.

DR. J. H. MASON KNOX and DR. J. C. MEAKINS, of Baltimore, said that they had taken seventy-two infants as a basis for this study, of these nineteen were used as controls, in whom the urinary findings were negative and in whom there was no intestinal infection. There were six cases of malnutrition, six cases of diarrhea, four cases of indigestion, fifty-three cases of definite intestinal infection. No urinary changes were found in thirty-one of the fifty-three; in thirty-two definite abnormalities had been found. More than one-half of these fifty-three were in the middle of the first year. The duration of illness ranged from about ten days to six weeks. There were thirty-four boys and nineteen girls. They made three classes of cases according to the urinary findings: (1) Those containing only albumin, or albumin and casts. (2) Those containing pus. (3) Those in

which in addition to pus there were albumin, casts, bacteria and red cells. They concluded that infection in the urine occurred almost as frequently where the cases were toxic as where there was very definite intestinal lesion, and that infection had its origin in the intestinal canal and reached the kidneys secondarily.

DR. ABT said that some of these lesions might be explained if one would accept the explanation of Frankenstein—that most of the intestinal lesions met with were not simply intestinal lesions but indications of perversion of metabolism with the production of toxic substances, much the same as constitutional diseases produced different types of acidosis. Pfaundler thought these intestinal lesions might have their pathological explanation by the Erlich side-chain theory. This might explain why gastrointestinal lesions were slight in comparison with the severe toxemia met with.

BRIEF OF CURRENT LITERATURE.

DISEASES OF CHILDREN.

Left Pyelonephritis from the Gonococcus in a Child of Six.—Artemio Magrassi (*Riv. di Clin. Ped.*, May, 1908) describes a case of pyelonephritis which occurred in a child of six years who had had a cystitis from gonorrheal infection. The extreme rarity of the condition in a child renders the case one of interest. When the patient was first seen she had a rounded tumor of elastic consistency in the left colic region, with turbid, acid urine containing albumin, pus cells, a few blood cells, and flattened epithelium. The child was anemic and cachectic and suffered from attacks of renal colic. The author found by examination and isolation of the urine of each kidney that the right kidney was in a normal condition and he removed the diseased kidney, which was the seat of an abscess and marked granulations of the pelvic lining. The child made a good recovery from the operation. When seen for another trouble some time afterward, she was well and the kidney was functioning normally.

The Facial Phenomenon in Diphtheria.—Angiola Borrino (*Riv. di Clin. Ped.*, June, 1908) describes observations made as to the frequency of facial spasm in diphtheria and the type of case in which it is usually found. She believes it to be a form of tetanus due to the poison of the diphtheria germ. An examination was made of the historical material from the Hospital in Florence from 1904 to 1906, and there were found 467 cases of diphtheria treated, of which 103 began to have facial spasm after their entrance into the hospital for treatment for diphtheria. The author found that only seventeen of the cases were of light type, the rest being instances of severe infection, with laryngitis, rhinitis or severe toxic and paralytic conditions. This symptom generally appears after the throat has become better and at the initiation of conva-

lescence. It is associated with asthenia, cardiac weakness, and bronchial paralysis. In postdiphtheritic paralysis the symptom is never absent. It is due to the retention of poison by the tissues and its predilection for the nerve tissues.

Gangrene of the Skin in Scarlatina.—Heubner (*Berl. klin. Woch.*, July 20, 1908) describes an absolutely unique case of scarlatina with a recurrence of fever and eruption three weeks after the first attack, characterized by severe pain in the joints. The eruption showed marked deep redness and swelling of the skin at various points, which amounted to a gangrenous condition over the right elbow-joint. A slough occurred which left a large denuded space which healed very slowly. The position of this gangrenous patch was such that it could not be due to embolism, on account of the numerous anastomoses in the circulation supplying the skin of the part.

Diphtheria and its Serum Treatment.—Adolf Baginsky (*Berl. Klin. Woch.*, July 6 and 13, 1908) discusses the effects of serum treatment of diphtheria in its relation to mortality. According to some authors the death-rate is no smaller now than before the use of antidiphtheritic serum was begun. The author states that this was about fifty per cent. He analyses the cases treated at the Krankenhaus in Berlin during 1907, and gives his conclusions. In this epidemic there were treated in the hospital 529 children of whom 466 recovered and 63 died. Of the sixty-three who died, making only 15.6 per cent. of the whole number, many cases may be eliminated as not dying as a result of the treatment. The first group under this heading consists of those children who came into the hospital in a dying condition, having been kept at home too long, and to these children, seventeen in number, the serum was given too late to get any effect for good in the patient. These children were in collapse, in acute stenosis, or in a state of general sepsis. In the second group are included ten children who were suffering from tuberculosis at the time that they became infected with diphtheria, and died as a result of the double infection. Most of these children showed at autopsy acute miliary tuberculosis. In these cases the use of the serum was ineffectual. A third group consists of seven cases in which death was caused by some complication. Of these, two had a complicating scarlatina and died of nephritis; one was a child fourteen days old, who had a diffuse phlegmon of the neck and throat with pemphigus neonatorum; in another tracheotomy was performed and death resulted from hemorrhage due to ulceration of the trachea; another died two months after intubation from a secondary stenosis; another died of pneumonia, and the last from heart failure. These deaths cannot be charged to the failure of serum treatment. Four other children died who received the injection too late to be of value. Thus we have thirty-eight cases in which death cannot be charged to failure of serum treatment. Another group of cases in which death occurred consists of the so-called "latent" cases, which are in

reality cases of nasal diphtheria in which, there being no membrane in the pharynx, the diagnosis of diphtheria is not made. There is a marked discharge from the nose forming bloody crusts, and a cachectic condition that should make diagnosis possible. Death results from a descending infection of the larynx. Of such cases there were nine, and they came into the hospital so late that the serum did not have time to act. Four cases of severe descending croup came too late to be relieved. We have left only eleven cases that were really refractory to serum treatment. Two received very small doses of serum and very late in the disease, and died of heart failure. If the serum is not given early in the disease we need not expect to get the best results from its administration. Of fifty-three cases injected late, thirty-six were not injected until the third day, and seventeen not until the fifth day of the disease. The author has never given more than from 1500 to 5000 units and does not believe that it is necessary to employ the massive doses of serum that are beginning to be given. He believes that when we have so educated the public that they do not question the efficiency and value of the serum treatment, and when all physicians are convinced that it must be given on the first day of the disease we shall avoid most of the deaths. There will be left deaths from difficult tracheotomies, and a few refractory cases; but the moribund cases, the nasal diphtheria cases in infants, and the cases of general sepsis will vanish.

Scarlatinal Rheumatism.—G. E. Wladimiroff (*Arch. f. Kinderheil.*, Vol. xlviii, Parts 3 and 4) describes scarlatinal rheumatism as occurring in the first days of the disease or up to the end of the second week. It consists of pain in the limbs, especially the legs, with some edema of the joints and skin. In other cases, which may be denominated *synovitis scarlatinosa*, there is true fluctuation of the joints. The author excludes these latter cases and confines himself to those in which pain is the most prominent symptom. The pain is often diffused over the entire limb and not localized in the joint. The author believes the condition to be a polyneuritis of infectious character. In two fatal cases the nerves were carefully examined and the fibers were found in a condition of degeneration. The treatment of this condition by salicylates is unsatisfactory, and the author believes that it is in no sense a rheumatic condition, but a nerve poisoning. In one case observed by the author the child showed ataxia when it commenced to walk. This neuritis is parallel with neuritis occasioned by other infectious diseases, such as typhoid fever and diphtheria.

Treatment of Scarlet Fever.—Max Goetz (*Munch. med. Woch.*, August 1, 1908) considers the care of scarlet fever, especially with reference to bathing and diet. He hesitates to use cold baths on account of the possibility of chilling of the skin and bringing about an attack of nephritis. He allows warm sponging of the limbs and body a portion at a time, the whole of the

body not being uncovered at the same time. He believes that nephritis is possible up to the fifth week of the disease, and does not allow a full bath until that time. He keeps the child in bed five entire weeks on that account. He believes that we must give the child sufficient nourishment to keep up his strength and that we cannot keep him long on a milk diet. After the first week he allows the child to eat what he likes and as much as he wants, provided that meat, eggs and soups are excluded. The author gives a bill of fare that may be of use to the mother in feeding children with scarlatina. He has treated 150 cases of the disease with three deaths. He has never had a case of scarlatinal nephritis of the inflammatory type. He believes that such cases are better treated in a hospital than at home, but that this is not always possible.

Treatment of Blennorrhœa Neonatorum with Ox Serum.—W. Gilbert (*Münch. med. Woch.*, July 28, 1908) describes an attempt to treat gonorrhœal ophthalmia with ox serum by instillation into the conjunctival sac. Fresh ox serum has a specific effect on purulent processes. Eight cases of gonorrhœal blennorrhœgia were treated by the author with ox serum. The conjunctival sac is first freed from pus and the serum is then syringed into it. The amount of pus is at first increased, then it becomes thinned and gradually lessens in amount. The medication is used every two hours day and night. The worst cases may be cured without the use of silver solutions. In slow cases the use of a mild silver solution will hasten the cure. In eight days the amount of pus was greatly decreased.

Etiology of Whooping-cough.—C. Fraenkel (*Münch. med. Woch.*, August 11, 1908) has examined the sputum of eight cases of whooping-cough with reference to the bacteriological cause of the disease. According to Bordet and Gengou, the etiological factor in this disease is a microorganism similar to the bacillus of influenza. The sputa were inoculated on media containing human blood. The colonies were of a yellow or yellowish-brown color, spread over the culture medium. The influenza bacillus grows differently from that isolated from these cultures. Its colonies are smaller and whiter. The whooping-cough bacillus is a small, motionless organism, stained by Gram stain. It was found in the early days of all the eight cases that were examined. When apes were inoculated with it there was produced a paroxysmal short cough, which lasted eight or ten days. No expectoration was observed in these animals.

Georg Arnheim (*Berl. klin. Woch.*, Aug. 3, 1908) has examined the sputum of twenty cases of whooping-cough and made five autopsies, seeking for the bacillus of Bordet and Gengou. He has isolated the bacillus in six cases, and propagated it to the tenth generation. The agglutination with horse serum was positive. Agglutination and complement fixation was shown with serum of immunized animals and serum of children who had had the disease, and in animal experiments.

Rheumatism in Children.—C. H. Dunn (*Arch. Ped.*, July, 1908) says that rheumatism in children must be placed in that class of acute infectious diseases which do not necessarily show characteristic or localizing symptoms at the onset. Constitutional symptoms are usually absent or slight. Joint symptoms are comparatively slight, and when present are very mild as compared with those in adults. Their duration averages a little less than two days. Usually more than one joint is affected, but the number is generally fewer than in adults, a general polyarthritis being rare. The nearer adult life is approached, the more does the type of the disease approach that seen in adults. The cardiac manifestations of rheumatic fever in children are of importance, in the first place on account of their great frequency of occurrence. In the writer's series, 91 per cent. of all cases had evidence of an organic lesion in the heart, which is a very much larger proportion than that observed in the rheumatism of adults. In children endocarditis usually betrays itself by actual symptoms referable to the heart. In 65 per cent. of the author's cases having a murmur there were actual cardiac symptoms. The symptoms themselves are the ordinary ones of cardiac weakness: dyspnea, palpitation and precordial pain in the milder cases, with the addition of edema and cyanosis in the severer ones. It is not the character of these symptoms which is of importance, but their severity, obstinate duration and danger to life. They are accompanied by fever and evidence of acute infection. Another peculiarity of rheumatic fever in children lies in the occurrence of cases in which the only localization of the infection is the cardiac—the primary acute rheumatic endocarditis of childhood—cases which run a course characterized by fever and cardiac symptoms only. One of the most important peculiarities of rheumatic fever in childhood is the liability to recurrence of the infection with varying manifestations. At one time the symptoms are mainly cardiac, at other times mainly articular, at still other times a combination of both types. Any attack may be accompanied by pericarditis or followed, accompanied or even preceded by chorea. While none of the above statements conflict with the accepted beliefs, they are of sufficient practical importance to be worthy of reiteration.

The Scoliosis of School Children.—Fernand Lagrange (*Arch. de Méd. et Chir. des Enf.*, July, 1908) insists on the great frequency of scoliosis in school children. This trouble is also very frequent in all factories where young men or women are seated at their work for long hours of the day. In the French schools, according to the statements of this author, the children sit for many hours on benches which have no backs and no arms, thus affording no support at all for the body. He finds the cause of scoliosis in the long immobility in an upright sitting posture. In adult there is greater ability to remain in a fixed position than in the child. Children are much better able to perform exercises that require repeated rapid motion, but the unformed muscles and bones of

the child render it peculiarly difficult, even impossible, for him to maintain for a long time the same fixed attitude. In standing or sitting he endeavors to rest his muscles by leaning to one side, resting on one foot, or on one buttock if sitting. In so doing he produces the scoliotic position as a position of rest. It allows of the relaxation of one set of muscles of the back at a time. He generally rests more frequently on one hip, the left, and thus produces the condition of permanent scoliosis. Forcing the child to sit for hours will cause the weak and predisposed to acquire scoliosis, while the well child will not suffer from the act. In treating this condition it is most important to allow the child to rest on his back in order to relax the strained muscles. This is the first principle of treatment. It should be followed by exercises that are not violent and are purely educative, not involving much effort on the part of the child, to reeducate the weakened muscles.

Human Milk as a Cause of Tuberculosis.—Mathildo de Biehler (*Arch. de Méd. et Chir. des Enf.*, July, 1908) takes the stand that it is sufficiently demonstrated that tuberculosis is an acquired, not a hereditary disease, and that the predisposition of the child of the consumptive is exactly that of other children. The precautions taken against tuberculosis in meat and milk have not diminished the cases of tuberculosis in children, and the primary lesions are those of the lungs, showing that the infection is aerial in most cases, not intestinal. It has been found that when the child of a tuberculous mother has been nursed by another woman but is allowed to inhabit the same house and rooms with his mother, he is very apt to contract tuberculosis, in spite of the different milk. This is due to infection from hands and articles in the room inhabited by the tuberculous mother. The author cites six cases of tuberculosis in nursing women from whom the breast milk was obtained aseptically and was injected into guinea-pigs. The pigs all lived, gained in weight, and showed no symptoms of ill health. Autopsy showed no anatomo-pathological lesions. This proves, as far as so limited series of experiments can, that the milk of a tuberculous mother will not cause tuberculosis in her infant. Tuberculosis rarely shows itself before the ages of three months, but appears after the child is of an age to remain longer in the same surroundings as the mother, thus showing that it is contact with her that causes infection.

Emphysema as a Complication of Intubation.—Franz Hammes (*Arch. f. Kinderheil.*, Vol. xlviii, Parts 3 and 4) considers the origin of emphysema under the skin of the neck as a result of intubation. The usual complications of intubation are decubitus, false passages and cicatrization of the larynx producing stenosis. An unusual complication is emphysema of the interstitial tissues of the neck from penetration of air under the skin. Two possibilities may account for this condition; one is severe lesions of the mucous membrane in the introduction of the tube; or by necrosis from pressure. In other cases the intubation is harm-

less to the membranes and lasts but a few hours or days; here there must be an alveolar rupture in the lungs to allow of the penetration of the air. According to some authors it is severe coughing which is responsible for this rupture; but the condition occurred in two cases observed by the author in which there were no severe coughing attacks. Alveolar rupture occurs in tuberculosis, whooping-cough and bronchopneumonia, as well as in diphtheria. The author believes that the alveolar rupture is caused by the urgent efforts of the child at respiration through an almost entirely occluded larynx. The act of inspiration brings about the rupture of the vesicles and the expiration then drives the air into the tissues. He finds that this rupture occurs at the moment when the finger occludes the glottis in placing the tube in position.

Infant Feeding.—In considering various methods of substitute infant feeding Frederick Langmead (*Clin. Jour.*, July 15, 1908) finds the following disadvantages of diluted milk: 1. It is a bulky form of food given at an age when any distention of the stomach is particularly undesirable. 2. More manipulation is required than may be safely entrusted to many mothers. 3. The dilution necessary at special months and the subsequent variation of amounts of added constituents is too involved to be accurately complied with by the average mother. 4. The curd, although small in bulk, remains still much more coarse or less flocculent than that of human milk. 5. Cream must be added, but costs more than many mothers can afford, and usually contains preservatives. For this reason he favors the use of citrated whole milk. He has employed this successfully in about fifty cases. The child is weighed when first seen and again a week later, and the frequency and size of feedings depend upon the weight change and the child's general condition and size. For the first five weeks the intervals are usually two hours, for its second five weeks two and a half hours, and from then until the next month, three hours; with two night feedings until three weeks old and one from three to six weeks. The quantities are about those given by Holt or somewhat less. Two grains of sodium citrate are added to each ounce of milk, the necessary amount for each feeding being dissolved in one dram of water. The milk is brought to the boil and the citrate solution is added while cooling. The amount of milk is regulated by subsequent weighings. At about five months the citration is gradually diminished until plain milk can be taken. The sodium citrate causes the formation of a fine flocculent curd in the stomach. Constipation has not seemed more troublesome than with other methods of feeding.

Infant Feeding.—C. G. Grulee (*Arch. Ped.*, October, 1908) favors a four-hour interval in infant feeding because he believes that it possesses the following advantages: It enables the stomach to have a period of rest between feedings. It makes possible an antiseptic action by the free hydrochloric acid of the gastric juice. It trains the child to longer periods of rest between

feedings. It is a strong factor in preventing over-feeding. It acts in a striking manner in overcoming certain cases of vomiting caused probably by the failure of the stomach to obtain rest under previous conditions.

Character of Stools in Diarrheal Affections.—J. H. M. Knox (*Jour. Amer. Med. Assn.*, October 17, 1908) draws his conclusions on this subject from the notes of one-hundred fatal cases recorded at the Thomas Wilson Sanitarium. Mucus is evident to the naked eye in a large percentage of diarrheal stools of infancy. Its absence renders the presence of serious intestinal lesion improbable. Mucus in large amounts may be found in the stools in all intestinal disorders, but the proportion of cases with extensive intestinal alteration is greater when the quantity of mucus is in considerable excess. Blood in the diarrheal dejecta of infants suggests an alteration of the intestinal mucosa in proportion to the amount of blood present. On the other hand, extensive changes may occur in the bowel-wall without the macroscopic presence of blood in the discharges. Pus in the diarrheal stools of infants indicates, according to its quantity, alteration in the mucosa, particularly in that of the large bowel. The failure, however, to detect pus in the stools with the naked eye does not preclude the possibility of extensive intestinal lesion. Blood and pus are more frequently found in diarrheal movements in the middle half of infancy, and these elements at this time form a correspondingly more reliable index of the conditions of intestinal mucosa. Blood and pus rarely appear in the diarrheal discharges of infants before the beginning of the second week of their illness. They are more frequently found from the third to the sixth or eighth week, and are usually absent after this period, when the illness, if it continues, may assume a marantic character. Blood and pus are often found mingled in the same stool. Less often blood appears alone, and still less frequently is pus noted in the dejecta of infants who have not passed blood. The presence of these elements indicates the probability of thickening and infiltration or of ulceration of the mucosa of the small, but more certainly of the large intestine.

Dental Caries as Cause of Disease in Children.—Charles Hermann (*Arch. Ped.*, August, 1908) discusses the diseases which may result from abnormal condition of the teeth. By simple inspection, without use of mirror or plobe, he found dental caries in 72 per cent. of 1200 school children examined, many of these not of the poorer class. He believes that the only way these school children can be reached is by a dental clinic under municipal control, open after school hours and on Saturday, with regular examination of the children at school. Instruction in the care of the teeth and demonstrations of the method of cleansing the teeth should be given at the clinic. The estimated cost is about fifty cents for each child. These are about 300,000 school children in the borough of Manhattan of whom 100,000 are really poor and require such treatment.

Congenital Laryngeal Stridor.—A. W. Myers (*Arch. Ped.*, August, 1908) gives the chief theories of the cause of this condition as laryngeal deformity and tracheal compression, usually by an enlarged thymus gland. In support of the latter theory he describes a case with coexistence of the clinical features of congenital laryngeal stridor and physical signs strongly suggesting enlargement of the thymus, these signs disappearing under x-ray treatment while the laryngeal stridor cleared up simultaneously.

Obscure Fever in Infancy and Early Childhood.—Excluding those elevations of temperature which are obscure only through lack of a careful physical examination. J. L. Morse (*Bost. Med. and Surg. Jour.*, July 9, 1908) mentions, as causes to be thought of, pneumonia without obvious physical signs, encysted or interlobar empyema, endocarditis, typhoid fever, malarial fever, eczema, fever in the new-born due to starvation or more often to sepsis, occasionally dentition, absorption from tonsils and adenoids, otitis media, cervical adenitis, bronchial adenitis, pyelitis, anemia and rickets. It may be thought probable that a large proportion of the obscure fevers of infancy and early childhood are due to tuberculosis, but this the writer doubts as the disease, at this period of life, so frequently runs the course of an acute general infection terminating fatally. Long continued elevations of temperature in infants and young children is often the result of mild intestinal toxemia. Finally, there is a class of cases of continued fever in infancy and early childhood in which the most careful examination fails to find any cause for the fever, in which no modification of the diet is of any avail and in which the general condition is unaffected, the child being apparently well and gaining normally in weight. Such cases justify the conclusion that if a careful study and thorough examination of the child does not reveal the cause of the fever, there is, in the vast majority of cases, nothing serious the matter and no cause for anxiety.

Calmette's Ophthalmo-reaction to Tuberculin.—J. B. Hutchinson (*Dubl. Jour. Med. Sci.*, July, 1908) says that this is a simple, harmless and efficient means of diagnosis. Its limitations are few. It is useless, for diagnostic purposes, in the case of children under one year, even those born of tuberculous mothers. This is an argument in favor of the theory that a child is never born with tuberculosis. Infants of two years old react in the proportion of 3.42 per cent., and the percentage materially increases with age. Secondly, it is almost useless in cachectic, moribund, or very advanced cases of pulmonary tuberculosis, and in cases of acute miliary tuberculosis.

Tuberculous Infection Through Milk.—E. C. Schroeder (*Pediatrics*, July, 1908) states that no satisfactory reasons have been found to conclude that there is a specific difference between the tubercle bacilli that affect man and those that affect cattle. It has, however, been proven that the bacilli from human and

from bovine sources differ greatly in virulence and that those from bovine sources are almost constantly the more virulent. As the morphology and virulence of tubercle bacilli can be greatly modified by cultural methods and by passage through animals, morphological, biological and biochemical tests are of doubtful value when employed to determine whether a tuberculous individual became affected from a human or from a bovine source. Under existing conditions it seems imperatively necessary that milk should not be regarded as fit for certification unless it is obtained from cows of which we know that they are free from tuberculosis and that they are stabled, pastured and milked in an environment free from tuberculous infection. All milk obtained from cows that are not certainly free from tuberculosis, or that are stabled, pastured or milked in a tuberculous environment, should be pasteurized before it is used as food.

As far as it is possible to do so, all milk intended for use as food, either in the form of milk or one of its products, should be obtained from certainly healthy cows in a certainly hygienic environment, or should be pasteurized or sterilized before it is used.

Diagnosis of Pneumonia in Infancy.—According to R. G. Freeman (*Jour. Amer. Med. Asso.*, July 25, 1908), one who waits for the discovery of positive physical signs of pneumonia in an infant may have to wait until the patient is convalescent. The disease presents characteristic signs on which a diagnosis may be based before the lungs are examined. The symptoms are sudden onset, depression, rapid respiration with ratio to pulse of 1 to 3, fever and usually cough. If with these are noticed flaring nostrils, pneumonic breathing and expiratory grunt, a definite diagnosis may be made, while rigidity of the neck and upper extremities without rigidity of the lower extremities is an important confirmatory sign if present. Auscultation and percussion of the chest should be used only in confirmation of the diagnosis and for localizing the lesion and for information as to its character.

Acute Anterior Poliomyelitis.—W. B. Cadwalader (*Med. Rec.*, September 19, 1908) presents a study of three cases of this affection. He says that acute anterior poliomyelitis is essentially an acute polioencephalomyelitis. The process is the same during infancy and adult life. The process is most marked in the lumbar and cervical enlargements of the cord and frequently may extend upward as far as the cerebral cortex. Interstitial changes predominate and occur together with parenchymatous changes. Parenchymatous changes never occur without interstitial changes. The localization and intensity of cellular infiltration depend upon the distribution and vascularity of the area affected. Neuronophagia is an important factor in the destruction of ganglion cells.

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