# PROCEEDINGS

OF THE

# CONNECTICUT MEDICAL SOCIETY,

# 1895.

ONE HUNDRED AND THIRD

## ANNUAL CONVENTION,

HELD AT

## HARTFORD, MAY 22D AND 23D.

PUBLISHED BY THE SOCIETY.

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N. E. WORDIN, A.M., M.D., SECRETARY.

BRIDGEPORT.

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BRIDGEPORT, CONN.:
THE FARMER PUBLISHING COMPANY.
1895.

The Connecticut Medical Society does not hold itself responsible for the opinions contained in any article, unless such opinions are endorsed by special vote.

All communications intended for the Connecticut Medical Society must be addressed to N. E. Wordin, M.D., Bridgeport, Conn.

The Century Dictionary has been used, as far as possible, in the preparation of this volume.

The next Annual Meeting of the Connecticut Medical Society will be held in New Haven, May 27th and 28th, 1896.

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# OFFICERS OF THE SOCIETY.

1895–1896.

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PRESIDENT.

SETH HILL, Stepney.

VICE PRESIDENT.

RIENZI ROBINSON, Danielsonville.

VICE PRESIDENTS, *ex-officio*.

IRVING W. LYON,
O. J. D. HUGHES,
JULIAN LAPIERRE,
FREDERICK B. BAKER,
FREDERICK A. MORRELL,
FREDERICK H. WIGGIN,
JOHN E. BAILEY,
FREDERICK GILNACK.

TREASURER.

W. W. KNIGHT.

SECRETARY.

N. E. WORDIN.

ASSISTANT SECRETARY.

JULIAN LAPIERRE.

COMMITTEE ON MATTERS OF PROFESSIONAL INTEREST IN THE STATE.

CHARLES S. RODMAN, ALVA E. ABRAMS,
RUSH W. KIMBALL.

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FRANCIS L. DICKINSON, M.D., GEO. L. PORTER, M.D.,
O. J. D. HUGHES, M.D., ABIEL W. NELSON, M.D.,
JAS. C. CAMPBELL, M.D.

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M. STORRS, M.D., F. BACON, M.D.,
L. S. PADDOCK, M.D., E. F. PARSONS, M.D.,
N. E. WORDIN, M.D.

E. J. McKNIGHT, M.D., Hartford County.
O. J. D. HUGHES, M.D., New Haven County.
F. N. BRAMAN, M.D., New London County.
J. W. WRIGHT, M.D., Fairfield County.
J. B. KENT, M.D., Windham County.
R. S. GOODWIN, M.D., Litchfield County.
D. A. CLEAVELAND, M.D., Middlesex County.
C. B. NEWTON, M.D., Tolland County.

*On Medical Examination.*

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MAX MAILHOUSE, M.D., HORACE S. FULLER, M.D.,
JOHN W. WRIGHT, M.D.

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FRANK W. WRIGHT.

*Committee on Publication.*

N. E. WORDIN, M.D., *ex officio.*
JULIAN LAPIERRE, M.D., *ex officio.*
W. H. DONALDSON, M.D.

*Committee of Arrangements.*

C. PURDY LINDSLEY, M.D., *Anniversary Chairman,*
M. E. O'CONNOR, M.D.,
FRANK H. WHEELER, M.D.

# PROCEEDINGS

OF THE

# CONNECTICUT MEDICAL SOCIETY

ONE HUNDRED AND THIRD ANNUAL CONVENTION

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The President and Fellows of the Connecticut Medical Society met in Jewell Hall, Y. M. C. A. Building, Hartford, on Wednesday, May 22, 1895. The President, Dr. Braman, called the meeting to order at 2:15. The Committee on Credentials made its report by calling the roll of regularly appointed delegates. Thirty-five were found to be present. This is a larger number than usual, both absolute and relative, because on account of one person occupying three positions and two others two each, the largest possible number of this voting body was reduced to fifty.

FELLOWS, *ex officio.*

*President.*

FRANCIS N. BRAMAN.

*Vice President.*

SETH HILL.

*Vice Presidents, ex officio.*

IRVING W. LYON,
O. J. D. HUGHES,
JULIAN LA PIERRE,
* FREDERICK B. BAKER,
FREDERICK H WIGGIN,
JOHN E. BAILEY,
* FREDERICK A. MORRELL,
* FREDERICK GILNACK.

*Treasurer.*

WILLIAM W. KNIGHT.

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*Absent.

*Secretary.*

N. E. WORDIN.

*Committee on Matters of Professional Interest in the State.*

IRVING W. LYON, FREDERICK H. WIGGIN, *CHARLES P. GRAVES.

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## FELLOWS BY COUNTIES, ELECTED IN 1895.

*Hartford County.*

I. W. Lyon, G. R. Shepherd, J. A. Coogan,
Henry Doutteil, H. O. Allen.

*New Haven County.*

J. H. Townsend, M. C. O'Connor, A. W. Marsh,
R. A. McDonnell, E. W. Pierce.

*New London County.*

R. W. Kimball, W. T. Browne, William Witter,
* J. G. Stanton, E. P. Douglass.

*Fairfield County.*

W. H. Donaldson, F. C. Graves, * F. D. Ruland,
* W. J. Tracey, W. B. Cogswell.

*Windham County.*

C. J. Fox, J. B. Kent, * S. B. Overlook,
* C. E. Hill, * L. Holbrook.

*Litchfield County.*

W. S. Munger, W. S. MacLaren, * T. S. Hanchett,
* E. L. Pratt, L. Y. Ketchum.

*Middlesex County.*

F. K. Hallock, * C. A. Sears, F. D. Edgerton,
G. N. Lawson, * F. L Potter.

*Tolland County.*

E. K. Leonard, C. F. Sumner, * F. L. Smith,

*Absent.

The first named in each county constitute the Nominating Committee. It will be seen that Hartford and New Haven Counties had full delegations, while New London had one absent, Middlesex and Tolland each only two.

The President then delivered the

## ANNUAL ADDRESS TO THE FELLOWS.

*Gentlemen—Fellows of the Connecticut Medical Society:*

It gives me great pleasure to extend to you a cordial welcome, and to bespeak your cheerful and hearty coöperation in transacting the business which may be presented for our consideration.

Our predecessors, recognizing their duty and obligation, not only to their own, but to succeeding generations, endeavored to lay the foundation for a higher and more uniform medical education, believing that the promoting of medical knowledge among physicians "is the necessary and direct means to restore health, and even preserve life; and is of great importance, as it will render the practice of physic more safe and serviceable to the patient and at the same time yield more satisfaction and honor to the profession."

Acting in accordance with these convictions, those patriotic pioneers in medical education appeared before the Colonial Assembly in 1763 with a memorial praying for the establishment of a State Medical Society and Medical Practice Act; a portion of which, reads as follows:

"And whereas, more than one hundred years have already passed away since the planting this colony, and nothing has been publicly done to distinguish between the honest and ingenious physician and the quack or empirical pretender, by reason of which imposture and imposition has been, and is still, but too commonly practiced among us to the great injury of the people as well as the disparagement of the profession,

"We your Honours, Memorialists, would therefore humbly pray etc.," closing with—"Or otherwise enact and order some proper regulation for the practice of physic as in your wisdom shall be thought most proper. And as in duty bound shall ever pray. Dated at Norwich the 27th day of September, 1763."

"In the Lower House the question was put whether anything should be granted on this Memorial.

Resolved in the negative,

Test. Abrm. Davenport, Clerk."

This curt disposal of a worthy memorial by the Colonial Assembly did not daunt those intrepid physicians from further effort in the same direction and that important measnre so boldly pushed to the front by a county delegation, in dne time became the prevailing sentiment of the physicians of the entire state. And now, after another hundred years of memorializing the Colonial Assemblies and State legislatnres, as it were "threshing over old straw," we are now passing throngh the experimental stage of our first medical practice act.

Our fathers were more successful in securing favorable legislative action on a memorial for a State Medical Society. It only required thirty years of persistent effort, ere their prayer was answered.

The Committee on Legislation last year made this surprising affirmation: That the State in 1893 gave to the public almost as much health legislation as in all the previous history of the State. It was indeed a year long to be remembered and significant as marking the beginning of an epoch in medical legislation, and a deepening interest on the part of the public in health matters. May we not all rejoice at this evidence of the beginning of popular, as well as legislative wisdom. The most hopeful could not expect the enactment of a perfect law; and although too soon to determine as to its merits, the general acquiescence in its provisions is a favorable augnry for the future. That it may be defective in some of its minor details goes without saying. If statutory, the rectifying of such defects can be safely entrusted to the judgment of the committee on legislation. The remedying of all other defects comes within the province of this organization, and I wonld snggest that where there is undue friction in the enforcement of the law, the Society at its present session, remove or modify the defect. The committee, in its report, will without doubt recommend such alteration as its mature deliberations may dictate. I trust the committee as now constituted will be continued. In my jndgment, the time is not far distant when this society will find it expe-

dient to reform other legislative matters aside from the medical practice act; and when it will be recognized as one of the more, if not the most, important standing committees in the Society.

We look forward with interest to the report of the committee on medical examinations, for from its report we get a clearer conception of the working of the Practice Act, than from any other source. During the present year the term of service of of Dr. John B. Kent will expire, and it will be the duty of the nominating committee to suggest a name to fill the vacancy.

The importance of the Committee on Matters of Professional Interest in the State, cannot be over-estimated; for through it we ought to become conversant with the status of medicine in every part of the Commonwealth. And, with that thought in view, a By-Law was enacted, which reads substantially as follows: "The Committee shall consist of three members—and, the more effectually to perfect the report, it shall be the duty of each county, and other association represented in this Society, annually to appoint one of its members as a reporter, who shall furnish to this Committee, on or before the first day of May all the information he can get, relative to this subject, within the limits of the district in which the local association exists." Notwithstanding some very able and interesting articles have been given to this society in the past, I do not think anyone at all conversant with the results of the Committee's work would maintain that it had at any time reached the ideal point set by those who framed the law. I do not know that the desired object can be secured. Certainly not as the Committee is now constituted; and that the matter may be thoroughly considered, I offer the following suggestions: That the Committee be composed of eight members, and that the County Reporters constitute that Committee, that by virtue of their election they become Fellows of the State Society, that the Committee be as now, a standing Committee and that they meet and organize by the election of a chairman and secretary at the first annual session of the Fellows, next following their election; that they divide the work among their members as in their judgment will best accomplish the object desired, and that the redundant office of

Reporter on Medicine and Surgery be abolished and the duty devolving upon said reporter be performed by the Committee on Matters of Professional Interest in the State constituted as above. I wish these suggestions might be considered in Committee—with your indulgence I will read a By-Law in order that I may emphasize one word—it reads as follows: "The President and Fellows at any annual meeting, and after one year's nomination of every candidate, and not otherwise, may by a major vote of those present, elect *eminent* physicians not resident in this State to be honorary members of this Society. I wish to emphasize the word *eminent*, and in order to avoid unpleasant possibilities, I recommend that the Committee on honorary membership be a standing committee, and that, after this year, they report at the next annual session after their election, thus giving them one year to investigate the standing of each nominee. I am informed by the Secretary that 700 copies of the Proceedings are not sufficient to supply the demand, and if files are to be furnished to all who ask for them, it will be necessary to print at least 750 or 800 copies, (unless otherwise provided for). And, by way of parenthesis, I will state that the business manager of the Yale Medical Journal assured me that he would submit a proposition to the Society for the publication of its Proceedings in that Journal.

It is very gratifying to know that there has been more than ordinary interest manifested in the County meetings this year, as shown by increased numbers in attendance, as well as literary material of an advanced order. There are other subjects of importance which might be brought to your attention at this time, but I do not wish to weary you, or farther encroach upon your valuable time.

It is however a fitting, as well as a kindly act for the Society to devote a few of the early moments of this opening session to a remembrance of those who have fallen in our ranks during the past year—Drs. H. S. Wildman, N. J. Hanlon, George C. Gay, of Waterbury, W. H. Lewis, of Moosup, W. A. M. Wainright, of Hartford, and Stephen G. Risley, of Rockville, have rested from their labors. Their loss to the city or town in which they lived is well nigh irreparable. Many of you are familiar with the qualities of mind and heart which endeared them to

their constituents, their colleagues and their homes. Tribute to their memory should not be allowed to remain unuttered. The ranks of our honorary membership have also been invaded. We cannot pass the name of Oliver Wendell Holmes in silence. His connection with the science of medicine has been conspicuous and honorable. He was a consistent advocate of higher education and reform in medicine; a teacher, progressive, able and ardent. Dr. Cheever refers to his lecture-room efforts as "That charming hour of description, analysis, simile, anecdote and harmless pun, which clothes the dry bones with poetic imagery, enlivens a hard and fatiguing day with humor, and brightens to the tired listener the details of a difficult though interesting study." His place among men of letters was unique, and his death is mourned as an irreparable loss to medical science, literature, poetry and social life. May we not all join with his classmate, Rev. Dr. Samuel Francis Smith, as he sings:

"Dear Master of the tuneful lyre
How shall we breathe the word Farewell?
How shall we touch the trembling wire
Which vibrates with thy mystic spell?

"The world seems poor of thee bereft,
The evening sky without the sun,
The setting, not the gem, is left;
The frame remains, the picture gone.'

A notice of the death of Dr. George Chandler on May 17, 1893, an honorary member of this Society, has not as yet been made a matter of record. Through the courtesy of Dr. Emerson Warner, of Worcester, Mass., I am enabled to furnish the following obituary, taken from the Worcester Daily Spy, May 18, 1893:

OBITUARY NOTICE OF DR. CHANDLER FURNISHED BY DR. WARNER OF WORCESTER, MASS.

Dr. George Chandler, one of Worcester's oldest and most esteemed citizens, died at his residence, 24 Chestnut street, at 10:30 last evening, of diseases incident to old age. Dr. Chandler was born in Pomfret, Conn., April 28, 1806. He was the son of Major John Wilkes Chandler and Mary Stedman Chandler. His father was a farmer and until his seventeenth year Dr. Chandler remained at home on the farm. After that time he

attended the academies at Dudley and Leicester, spent two years at Brown University and graduated at Union College in the class of 1829. He received his medical degree from Yale College in 1831.

Immediately after receiving his degree he opened an office in this city. In March 1833, he became Dr. S. B. Woodward's assistant at the State Lunatic Hospital. In 1842 he was appointed Superintendent of the New Hampshire State Lunatic Asylum at Concord. In 1846 he succeeded Dr. Woodward as Superintendent of the State Lunatic Hospital in this city, leaving the New Hampshire Asylum in a flourishing condition, the result of his labors and abilities. His administration of the Hospital, which lasted for ten years, was marked by great success. He retired at the expiration of that time, making his home in Worcester and giving up active practice, having devoted twenty-five years to the care of the insane.

Dr. Chandler has been a member of the Massachusetts, Rhode Island and Connecticut state medical societies. In 1859 he represented Ward 8 in the Legislature, and in 1862 was a member of the Board of Aldermen. He was a member of the Antiquarian Society and the Worcester Fire Society. He was at one time inspector of the almshouse at Monson.

In 1862 he responded to the call for volunteer surgeons and went to Fortress Monroe, and returned in medical charge of transports.

Dr. Chandler was married in 1842 to Josephine Rose, granddaughter of Dr. William Paine. The children by this marriage were Mrs. A. George Bullock and Mrs. Waldo Lincoln.

His first wife died in 1868; and April 8, 1874, he married Mary E. Douglas, widow of Charles D. Wheeler, who survives him.

I now declare the one hundred and third session of the Connecticut Medical Society organized, and ready for the transaction of business.

The President immediately announced the Regular Committees:

*On Credentials.*

N. E. Wordin, Henry Doutteil.

*On Unfinished Business.*

Charles F. Sumner, Edmond P. Douglass.

*On County Resolves.*

Lowell Holbrook, W. J. Tracey,
E. W. Pierce.

*To Nominate Essayists on the Progress of Medicine and Surgery.*

O. J. D. Hughes, F. B. Baker,
J. G. Stanton.

*On Business.*

N. E. Wordin, F. C. Graves,
J. A. Coogan.

*On Honorary Members and Degrees.*

J. D. Edgerton, T. S. Hanchett,
G. R. Shepherd.

*Auditing.*

C. A. Sears, William Witter.

*On Reception of Delegates and Invited Guests.*

James Campbell, C. D. Alton,
G. C. Segur.

The Treasurer first rendered his report, which showed a skillful management of the Society's finances.

## REPORT OF THE TREASURER.

*To the President and Fellows of the Connecticut Medical Society:*

As Treasurer, I present the following report of the finances of the Society for the year ended May 21st, 1895:

RECEIPTS.

| | | |
|---|---|---|
| Balance from old account, | | $ 319 44 |
| Received from County Clerks: | | |
| Hartford County, | $ 279 00 | |
| New Haven " | 329 40 | |
| New London " | 87 75 | |
| Fairfield " | 200 25 | |
| Windham " | 50 86 | |
| Litchfield " | 57 00 | |
| Middlesex " | 117 90 | |
| Tolland " | 31 95 | |
| | | $ 1,154 11 |
| Total receipts, | | $ 1,473 55 |

EXPENSES.

| | | |
|---|---|---|
| Printing Proceedings, | $ 403 54 | |
| Binding Proceedings, | 127 42 | |
| Stationery and Printing, | 62 55 | |
| Postage, | 54 31 | |
| Expenses Com. Matters Prof. Int., | 35 03 | |
| Expenses of Secretary, | 11 05 | |
| Salary of Secretary, | 150 00 | |
| Salary of Treasurer, | 25 00 | |
| Total expenses, | | $ 868 90 |
| Cash in Treasury, May 21st, 1895, | | $ 604 65 |
| | | $ 1,473 55 |

DUE ON TAX OF 1894.

| | |
|---|---|
| Hartford County, | $ 00 00 |
| New Haven " | 60 00 |
| New London " | 22 50 |
| Fairfield " | 65 00 |
| Windham " | 9 00 |
| Litchfield " | 15 00 |
| Middlesex " | 00 00 |
| Tolland " | 2 50 |
| Total taxes in arrears, | $ 174 00 |
| Decrease from taxes in arrears last year, | $ 42 00 |

On account of the smaller tax this year the amount of taxes in arrears is a little less than last year, but the number of delinquents is about the same, seventy as compared with seventy-two. It does not seem as if there should be seventy members who are not willing to pay our small tax promptly.

The Society voted last year a tax of $3.00 but on consultation with the Secretary it was decided that this could be reduced a little, to $2.50, and at the same time pay all bills and increase the surplus a little. The Society now has a surplus on hand sufficient to pay for printing the Proceedings this summer when the bill comes due. Unless the expenses are to be considerably larger this year than last a tax of two dollars will be enough for the purposes of the Society the coming year.

Respectfully presented,

W. W. KNIGHT, Treasurer.

It was referred to the Auditing Committee.

Under the heading of Special Committees, Dr. H. E. Smith reported on the revision of the list of Medical Colleges:

*To the President and Fellows of the Connecticut Medical Society—*
*Gentlemen:*

Your Committee appointed to revise the list of reputable medical colleges beg leave to report.

Several matters relating to the list have been referred to the Committee from time to time during the year by your Secretary and by the Secretary of the State Board of Health, and have necessitated several conferences. These matters have been adjusted to the best of our ability, and the results appear in the list of accepted Medical Colleges.

It would seem most desirable that a standard of requirements should be adopted which could form the basis for the preparation of a list of colleges considered reputable by this Society, and your Committee has had in mind the preparation of a statement of requirements which could be presented for adoption.

But it has been found that it was not practicable, at present, to establish a standard which would be satisfactory to the Society, and at the same time just to the Medical Colleges, because the present is a period of transition from lower requirements to higher requirements on the part of the Medical Colleges. A number of the more advanced ones have already announced a longer period of study and higher requirements for matriculation and graduation, and the actions taken by the various associations of Medical Colleges indicate that many more colleges will make similar advances in the near future.

Your Committee have, therefore, deemed it wiser not to attempt, at this time, any general revision of the list already adopted by the Society, but to make only such changes as seem most obviously desirable.

In preparing the list which is herewith submitted, your Committee have included only those colleges which are classed as regular Medical Colleges, and have included all such schools which were in the previous list, with the exception of a few which have been found on examination of the records of the

various State Examining Boards to have had a large percentage of failures among their graduates.

It is of course recognized that there are probably colleges in the list which could have been removed as justly as those that were omitted, but no action was taken except where the evidence was conclusive.

Your Committee regard this list as a provisional one, to be modified in the near future, as circumstances require, and because it cannot be again revised by this Society for one year, it is recommended that another committee be appointed, with powers similar to those of the present one, to which matters pertaining to the list and requiring immediate adjustment, can be referred by the Secretary or by the Board of Health.

Respectfully submitted,
HERBERT E. SMITH,
FRANK W. WRIGHT,
N. E. WORDIN.

## LIST OF LEGAL AND REPUTABLE MEDICAL COLLEGES.

### CALIFORNIA.

California Medical College, of San Francisco.
Cooper Medical College, of San Francisco.
Medical Department, University of California, San Francisco.
College of Medicine, University Southern California, Los Angeles.

### COLORADO.

University of Denver, Medical Department, Denver.
Medical Department, University of Colorado, Boulder.
Gross Medical College, Denver.

### CONNECTICUT.

Yale University, Medical Department, New Haven.

### DISTRICT OF COLUMBIA.

University of Georgetown, Medical Department, Washington.
Medical Department, National University, Washington.

### ILLINOIS.

Chicago Medical College, Medical School, Northwestern University, Chicago.
Rush Medical College, Chicago.
Woman's Medical College, Chicago.
College of Physicians and Surgeons, Chicago.

INDIANA.

Central College of Physicians and Surgeons, Indianapolis.
Fort Wayne College of Medicine, Fort Wayne.

IOWA.

Medical Department, State University of Iowa, Iowa City.
College of Physicians and Surgeons, Keokuk.
Iowa College of Physicians and Surgeons, Des Moines.

KENTUCKY.

Hospital College of Medicine, Louisville.

MAINE.

Medical School of Maine, Bowdoin.

MARYLAND.

John Hopkins Medical School.
Women's Medical College, Baltimore.

MASSACHUSETTS.

Harvard University Medical School, Boston.

MICHIGAN.

Department of Medicine and Surgery, University of Michigan, Ann Arbor.
Detroit College of Medicine, Detroit.

MINNESOTA.

College of Medicine and Surgery, Minneapolis.
Minneapolis College of Physicians and Surgeons, Minneapolis.

MISSOURI.

University Medical College, Kansas City.
Missouri Medical College, St. Louis.
St. Louis Medical College, St. Louis.
Medical Department University of Missouri, Columbia.
Kansas City Medical College, Kansas City.

NEBRASKA.

Omaha Medical College, Omaha.

NEW HAMPSHIRE.

Dartmouth Medical College.

NEW YORK.

College of Physicians and Surgeons, New York.
Albany Medical College, Albany.
University of City of New York, Medical Department, New York.

Medical Department, University of Buffalo.
Long Island College Hospital, Brooklyn.
Bellevue Hospital Medical College, New York City.
Women's Medical College of the New York Infirmary, New York.
College of Medicine of Syracuse, Syracuse.
Medical Department, Niagara University, Buffalo.

NORTH CAROLINA.

Leonard Medical School, Raleigh.

OHIO.

Medical College of Ohio, Cincinnati.
Cincinnati College of Medicine and Surgery, Cincinnati.
Miami Medical College, Cincinnati.
Women's Medical College, Cincinnati.
Western Reserve University, Medical Department, Cleveland.
Starling Medical College, Columbus.
Medical Department, University of Wooster, Cleveland.
Toledo Medical College, Toledo.

OREGON.

Medical Department, Willamette University, Portland.
University of the State of Oregon, Medical Department.

PENNSYLVANIA.

University of Pennsylvania, Department of Medicine, Philadelphia.
Jefferson Medical College, Philadelphia.
Women's Medical College of Pennsylvania, Philadelphia.
Medico-Chirurgical College, Philadelphia.
Western Pennsylvania Medical College, Pittsburg.

SOUTH CAROLINA.

Medical College of the State of South Carolina, Charleston.

TENNESSEE.

Meharry Medical Department, Central Tennessee College, Nashville.

VERMONT.

Medical Department, University of Vermont, Burlington.

The graduates of the following named *extinct Medical Colleges* are declared entitled to registration by the Connecticut Medical Society only:

College of Physicians and Surgeons of the Western District of New York, organized in 1812—extinct since 1840.

The New York Medical College, New York City, organized in 1852—extinct since 1864.

Berkshire Medical College, Pittsfield, Mass., organized in 1843—extinct since 1867.

Vermont Academy of Medicine, Castleton, Vt., organized in 1818—extinct since 1861.

In commenting upon his report Dr. Smith said he had left out all but the regular schools. Three colleges had been omitted from the list of last year because twenty or thirty per cent. of their graduates are rejected in the examining boards of other states. The results of examinations by the state boards of Virginia, North Carolina, South Carolina, Maryland, Minnesota, and New Jersey, for periods covering from one to twelve years were available to the Committee and were used in arriving at this decision. The statements were gone over and put together. They showed that the University of Maryland, Baltimore, had 225 men examined by these boards; that 176 were licensed and 49 rejected, twenty-two per cent. The College of Physicians, of Baltimore, had 221 examined, of whom 161 were licensed and 63 rejected, twenty-eight per cent. One other Baltimore college and the Howard University showed similar results. The report was accepted, thus making this Committee a permanent one.

Dr. Shepherd spoke in behalf of the project alluded to by the President in his address, the proposition from the Yale Medical Journal to publish the Proceedings of the Connecticut Medical Society. He said it was unsatisfactory to receive the Proceedings late in the year and with the papers all together in a mass so that it was something of an effort to digest them. He felt it would be wiser to have the material distributed through the year. The Journal proposes to publish it and to furnish one copy to every member. The subject matter will be arranged so that the transactions of the Society can be bound

by themselves and the whole will cost no more than by the present method. He moved to adopt the plan, the details to be arranged by a committee to be appointed for the purpose.

Dr. Storrs moved that a committee be appointed to consider the question and arrange for the particulars if considered favorable.

Dr. Hughes said that the Society was large enough to pay for its own Proceedings and not allow it to go out of its own hands. We ought not to give it to young men who are not graduates, and have not the interests of the Medical Society at heart as we have. If the Proceedings are as good as they have been no fault can be found. He made a motion to lay the subject on the table, which was carried.

A committee of three, Doctors Hill, LaPierre and Kent, was appointed to consider the suggestions made by the President in his address.

Dr. F. W. Wright offered an amendment to Chapter IV, Section 3 of the By-Laws, which was referred to the Committee on Unfinished Business of next year for consideration and report.

*Resolved*, That Chapter IV, Section 3, of the By-laws of this Society be amended by striking out the sentence reading, "provided he is residing and practicing in said county," and inserting the sentence, "provided he has been residing and practicing in the state one year and said county six months."

The Committee to nominate Essayists on the Progress of Medicine and Surgery reported: Medicine, Max Mailhouse and C. B. Graves; Surgery, W. H. Carmalt and H. G. Howe.

The Committee on Business referred to the program which had been sent to all the members and stated that they would change the order of papers as circumstances or the Society should order.

Dr. Hughes, for the Committee to nominate Physician to the Retreat for the Insane, reported that they had had nothing to do.

## THE COMMITTEE ON LEGISLATION

Was called for. Dr. Storrs reported that the Committee had done but little. It had held a meeting in January, well attended, at which it was voted not to ask the Legislature for any change in the Medical Practice Bill. The members unanimously voted

that any attempted change would be ill advised. Reports from all parts of the State were fairly favorable to the working of the bill. Still considerable quackery was going on. We men in Hartford hoped to have a law to exclude it, but the prosecuting officers found that there was some way of getting around the law, in many cases which were brought to their attention. We had hoped to have something to include such cases. The greatest need we are suffering from now is that men can practice without being examined. There should be a statuto requiring all applicants for license to be examined. There are many colleges, reputable indeed, but of low standing. To make such a requirement would be to prevent Connecticut from being the state where all come who can not be admitted elsewhere; would be to exalt the standard of medicine in the State. The secretary of tho committee being called upon, read a report more in detail:

The Committee on Legislation has had one meeting during the first year, which occurred at the rooms of the Board of Trade, Hartford, on the 25th of January, at 2:30 P. M. The Committee on Medical Examinations was invited to be present as some questions involving changes in the Medical Practice Act were to be considered. There were present Doctors Storrs, Braman, Parsons, Goodwin, Paddock, Hughes, Wordin, and by special invitation Doctors C. A. Lindsley and H. W. Ring. The following suggestions were made by the Committee on Examinations in a written communication from its secretary. Also that all examinations be conducted in the English language.

New Haven, Dec. 11th, 1894.

Item I. It was voted to *recommend*, that the examination fee be "fixed" at ten dollars and that the law be so amended.

Item II. Also that the law be amended so that the examinations be held three times a year only and then on the second Tuesdays of March, July and November. (These two changes coincide with the law of Massachusetts.)

Item III. The committee also recommends that the law be so amended as to require all applicants for registration to pass an examination whether graduates of a medical college or not.

Item IV. We desire to call the attention of the committee to the fact that we have found one day insufficient for the proper

examination of candidates upon all the branches designated in the law.

ITEM V. It was also voted to suggest to the Committee on Legislation the advisability of so amending the law that certificates may be revoked after conviction of crime before a proper court of law, after a hearing before the committee and unanimous approval of the same.

The above is an extract from the proceedings of the Examining Committee of the Connecticut Medical Society at a session held on Dec. 11, 1894, at the office of the secretary.

MAX MAILHOUSE, Sec'y.

An opinion was called for as to the advisability of any legislation at the present session, to amend or alter the law. All were in favor of not attempting any. Each proposition, however, was discussed in order. Concerning the item that all applicants for registration should be required to pass an examination whether graduates or not, a sub-committee of three was appointed to consider the subject and report in writing to the general committee at some future time. Doctors Goodwin, Wordin and Parsons were named as the committee.

The committee expressed the opinion that it was desirable to have all examinations made in the English language.

Dr. Ring was present by invitation and presented the resolution concerning the prevention of blindness in children, which was adopted by the Society at its last annual meeting. The committee indorsed the resolution and a sub-committee of Doctors McKnight and Parsons was appointed to assist Dr. Ring in the presentation of the matter before the Legislature.

It may further be added that the resolution was adopted as a statute and passed by both branches of the Legislature through the efforts of Dr. Ring who deserves much credit for his judicious presentation of the case.

At its semi-annual meeting in Norwalk, the Fairfield County Medical Association appointed a committee to present to the Legislature and secure the adopting of a statute providing for a uniform manner of commitment of the insane to asylums and jails. This committee had a very pleasant hearing before the

joint eommittee ou Humane Iustitutions, but we learn, did not succeed iu the aecomplishment of its object.

N. E. Wordin,
See'y Committee on Legislation.

The report was accepted.

## THE REPORT OF THE COMMITTEE ON PUBLICATION.

The Proeeedings for last ycar, the time of our serviee, contaiued only two hundred and seventy-four pages and is a smaller book than has been issued since 1888. There were upon the program for the afternoon session twenty-three papers, just the number as for to-day. But of those twenty-three, only fifteen eame into the hands of this eommittee. It happens every year that some writers either withhold their manuscript altogether or give them to other journals for publication. We eauuot make the Proceedings valuable aud interesting without the eoöperation of the members of the Socicty, and we think that the By-laws should be adhered to in this respeet, that the County clerks should colleet all papers destined for the eommittee on Publication and forward them to the Secretary with their aunual reports. Ofteutimes the Publieation Committee has to expend considerable labor iu proeuring the papers. We feel as if this task ought to be spared us. Not only is the value of the Proeeedings thus impaired but the publieation is delayed. We ought to observe the same regulations in this matter which other soeieties require. This would materially lighten what is a work of some eousiderable importanee.

Your eommittee culled with eonsiderable eare the material provided. Only eleven of the papers were printed. We believe the Proeeedings will be better for not being too large, unless indeed it shall eontain much of original researeh and clinical experienee of the members of the Soeiety. Unfortunately we could present but two artieles on surgery, the braneh of general medicine which is attracting the most interest to-day. As direeted by the Soeiety we have had the book bound in eloth, as is the eustom with almost all the State Medieal Soeieties.

The report was aeeepted.

## THE EXAMINING COMMITTEE.

Dr. Mailhouse, Secretary of the Committee on Examinations, made the report of that committee for the past year.

*To the President, Fellows and Members of the Connecticut Medical Society:*

The Examining Committee of your Society presents herewith its annual report for the year ending this day.

Since your last meeting this committee has held nine sessions for the examination of candidates, of whom seventeen have been examined. Of these nine were desirous of practicing Midwifery only, and eight were general practitioners. Of the former, six individuals or sixty-six and two thirds per cent., were found qualified and passed; of the latter also, six, or seventy-five per cent., were found properly qualified and received certificates. Of the midwives rejected not one had taken a course in Midwifery in any institution, but they had all gained what little knowledge they possessed from observation and experience. Not one of them secured a rating of fifty per cent. and the committee are satisfied that they would have become a dangerons element in the community had not an efficient working of the law excluded them from practice.

Of those desirous of practicing Medicine, Surgery and Obstetrics, and rejected, one, who claimed to have gradnated from a medical school in Naples, exhibited such ignorance of medicine in all its branches that it was obvious to every one that he had never studied more than one year, if that. He was plainly an impostor who, but for the intervention of the law, would now be preying upon the public in this state. The other rejected candidate was a graduate of the Atlanta, Ga., Medical College. He had taken the two years course of that institution and he showed himself very poorly qualified to be entrusted with the health and lives of a modern community. As evidence of his capacity, or rather incapacity, it is only necessary to cite his answer to the question upon the treatment of puerperal fever, which was that he had never seen a case and that when he should get such a case he would look up the treatment in his books. His average marking was below sixty per cent., which was the minimum standard at that time.

The following comprises the names of those who have passed the examinations during the year now closing:

June 15, 1894, Friderike Stark, Meriden, Midwife.
Marie E. Thorstensen, South Norwalk, Midwife.
Ida Johnson, New Haven, Midwife.
July 27, 1894, Pietro De Sanctis, M. D., New Haven, University of Naples.
Aug. 31, 1894, Rosina Iugui, New Haven, Midwife.
Nov. 14, 1894, Cecilie Lawn, Meriden, Midwife.
Dec. 11, 1894, William Samisch, M. D., Carlsbad, Austria, University of Prague.
Feb. 1, 1895, William E. Bailey, M. D., Bridgeport, University of Glasgow.
Biagio Francolini, M. D., New Haven, University of Naples.
Feb. 1, 1895, Mary M. Bachman, Bridgeport, Midwife.
Mar. 6, 1895, J. Dumortier, M. D., South Norwalk, University of Ghent, and
May 3, 1895, John George Mollath, M. D., Meriden, University of Strassburg.

The examinations all took place at the office of the secretary in New Haven.

At the first meeting of this year, on February 1st, it was unanimously voted by the committee that henceforth candidates must attain a minimum standard of seventy-five per cent. in order to obtain a certificate in Medicine, Surgery and Obstetrics, and a minimum of sixty per cent. was established for midwives.

The committee has also deemed it advisable when necessary, to examine candidates in their native tongue, and although this procedure has caused some slight amount of trouble, it has on the other hand proven highly advantageous to some of the candidates who would have been unable to take the examinations, owing to their inability to properly express themselves in the English language. In order to do this, however, we have in one case required the services of a Mr. Cyrus, a pharmacist of Bridgeport, who acted as interpreter in the Swedish language, and in one other instance a Mr. Spinello, a student at Yale, who assisted us in examining a candidate in Italian. Such other

foreign tongues as were needed were found among the accomplishments of members of the committee.

The report of the Committee on Legislation referred to us for consideration at the last meeting of the Society, was found to contain nothing requiring action upon our part beyond such suggestions as we had already made in our last report, and we so informed that committee.

In our last report we referred to the advisability of extending our examinations over a period of two days, but urged no action upon that point. Since then we have been compelled to adopt the plan of a two-days session owing to the inability of candidates to complete the work in a single day. In fact at one examination at which there was a single candidate, the majority of the questions in each branch were eliminated in order that we might finish in one day. However, sufficient was left to test the knowledge of the applicant. The last two sessions of the committee were each extended into a second day and the expressed opinions of the candidates proved the wisdom of our plan. We intend to pursue the course in the future, at any rate so long as the law in its present form remains.

During the past year notice was received by us of an intended National Conference of Examining Boards at Baltimore, Md., during the meeting of the American Medical Association, and this committee was invited to participate therein. In accordance therewith, the secretary of this committee, having been appointed a delegate, went to Baltimore to attend the conference. The object of the association is to establish a uniform standard of requirements for all the medical colleges and examining boards in the country. Beyond the election of officers and the appointment of a committee to draft a constitution and by-laws, nothing was accomplished.

In December last the following action was taken by our committee:

*Voted:* To recommend to the Committee on Legislation that the fee for examination be fixed at ten dollars and the law be so amended.

That the law be so amended that the examinations be held three times a year only, and then on the second Tuesdays of March, July and November (as in Massachusetts); and

That the law be so amended that all applicants for registration be examined whether graduates of medical colleges or not, (as in New York).

It was also voted to call the attention of the Committee on Legislation to the fact that we have found one day insufficient for the proper examination of candidates upon all the branches designated in the law.

Finally it was voted to suggest to the Committee on Legislation the advisability of so amending the law that certificates may be revoked after conviction of crime before a proper court of law, after a hearing before the committee and unanimous approval of the same.

Subsequently a reply was received from said committee stating that in their opinion it would be unwise to attempt any legislation this year.

On February 1st also, the committee reorganized and re-elected Dr. H. S. Fuller as its president, and Dr. Max Mailhouse, secretary and treasurer.

A review of the nine sessions held during the past year shows that the committee was called together six times for the examination of a single candidate, that at each of two sessions there were three candidates, and at one session five candidates. At but one session, namely the annual meeting on February first, were all the members of the committee present. In case all had been present at each of the six sessions when but a single candidate appeared, the examination fee would not have sufficed to pay expenses. Nor is it just to a body of physicians, coming as they do from distant parts of the State, to ask them to appear once in thirty days as the law demands, for the purpose of examining a single applicant, and that one possibly an incompetent midwife. Would it not serve the State as well to adopt the plan suggested above, of holding three sessions in each year? We sincerely hope that some action will be taken upon this point by the Fellows at this time.

It has appeared to some of the committee that it might be well for the State Society to define the standing before the county meetings of those who have passed our examinations, but are graduates of colleges "not recognized" or who mayhap, are not graduates of any college.

With the close of this year expires the term of Dr. John B. Kent of Putnam. The remaining members of the Examining Committee desire to express to the Connecticut Medical Society, their sincere appreciation of the labors of this member from Windham County and of the invaluable aid which he has afforded us in all our deliberations.

All of which is respectfully submitted.

MAX MAILHOUSE, Secretary.

A motion was made to refer the report to the Committee on Legislation.

Dr. Mailhouse said there was no objection to that if the Committee on Legislation would do anything. If they will introduce these amendments into the Assembly right away, it will be better for the Committee and the Society. If they wait we will have to endure these things for two years more.

Dr. Edgerton remarked that it would be impossible to do anything with the present Legislature, unless as a matter of courtesy they should give us a special hearing. The matter will have to lie over for two years. A conference between the Examining and Legislative Committees can arrange the business. The Legislative Committee will be necessarily slow in anything which is not urgent. Ten dollars was not a sufficient fee for the men of the committee. It was rather a delicate matter. Those who drew up the law did not intend to put the State to any expense, but the State ought to pay and that would be a proper compromise.

Doctor Storrs explained that the Committee on Legislation requested Dr. Fuller, President of the Examining Committee, to present the views of that committee on the legislation required. The Legislative Committee were desirous of making any changes which they were convinced ought to be made. We consulted Mr. Gross. He said no, keep away; there are certain other changes which should be made. Give the law a longer trial. We decided to say nothing, but the propositions were treasured up and some time we hope to have them enacted. After inquiring of others they, too, said wait. In the best time everything possible will be secured by legislation.

Dr. Carmalt expressed the opinion that a reference to the

Committee on Legislation with recommendations of the approval of the Society for the changes proposed, is all that can be done.

This was done.

The Committee on County Resolves reported a request from New London County to have the names of F. J. Beckwith and J. F. Cronin stricken from the roll of membership for persistent non-payment of dues. The resolution was passed.

Dr. Edgerton, Chairman of the Committee on Honorary Members, recommended the election of those proposed at the last meeting, Sir James Grant of Ottawa and Henry O. Marcy of Boston, and proposed for action next year Doctors T. M. Prudden, New York; W. W. Keen, Philadelphia; T. G. Thomas, New York. The report was accepted.

Dr. Hughes made a motion that the Secretary be requested to officially notify Mr. Gross of his election to honorary membership.

Dr. Witter, of the Auditing Committee, reported that he had examined the accounts and vouchers of the Treasurer and had found them correct. The report was accepted.

Dr. Ingalls, Anniversary Chairman, said that in arranging for the meeting the committee had been desirous of extending the meetings over a longer period of time, but it was prevented because the by-laws say that the meeting of the Fellows must be on the day before the Convention. His plan would be to have the meeting of the Fellows in the morning, to be followed by the reading of papers during the afternoon of the same day, the President's address in the early evening, say seven o'clock, and the dinner immediately after. The next day have reading of papers, which should be continued until the program had been completed, and then have the meeting adjourned. More could come and stay through the entire sessions. If this plan should be tried and found not to be a good one it need not be kept up by the next committee, but would be at their discretion. He moved an amendment to the by-laws by striking out the words, "on the day or days immediately," in Chapter I, Sec. 3.

Dr. Carmalt said that the previous committees for some years had found the same trouble. He thought the change proposed a good one; that it would attract the attention of the members and secure a larger attendance. The amendment was referred to the Committee on Unfinished Business, to report next year.

The committee to report on the suggestions in the President's address reported advising the adoption of the reorganization of the Committee on Matters of Professional Interest in the State, as proposed, if the By-laws will allow. It also advised making the Committee on Honorary Members a permanent one, and this was adopted.

Dr. Lindsley stated that the By-laws say who are the President and Fellows. The number is specified and we can not legitimately add to them. It was moved that the proposition take the usual course.

The Nominating Committee was requested, in addition to the regular appointees, to bring in names for a Committee on List of Medical Colleges. It reported the same names as last year. The report was adopted.

## THE REPORT OF THE NOMINATING COMMITTEE

Was rendered by Dr. I. W. Lyon, as follows:

*For President.*
Seth Hill.

*Vice President.*
Rienzi Robinson.

*Assistant Secretary.*
Julian LaPierre.

*Treasurer.*
W. W. Knight.

*Committee on Matters of Professional Interest in the State.*
C. S. Rodman, A. E. Abrams,
R. W. Kimball.

*To Nominate Physician to the Retreat for the Insane.*
F. L. Dickinson, G. L. Porter,
O. J. D. Hughes, J. C. Campbell,
A. W. Nelson.

*Committee on Publication.*
W. H. Donaldson.

*Anniversary Chairman.*
C. P. Lindsley.

*Committee of Arrangements.*

M. C. O'Connor, F. H. Wheeler.

*Dissertator.*

S. B. Childs.

*Alternate.*

A. N. Alling.

*Delegates to American Medical Association.*

A. E. Abrams, J. H. Wiggin,
Nathaniel Hibbard, H. E. Smith,
L. B. Almy, J. E. Loveland,
G. A. Shelton, Frederick Gilnack,
Robert Lauder, R. S. Goodwin,
E. P. Douglass, E. W. Pierce.

*Delegates to Maine Medical Association.*

P. H. Ingalls, W. W. Hawkes.

*Delegates to the New Hampshire Medical Society.*

F. W. Simpson, J. B. Kent.

*Delegates to the Vermont State Medical Society.*

E. T. Davis, C. E. Munger,
G. N. Lawson.

*Delegates to the Massachusetts Medical Society.*

D. A. Cleaveland, M. V. B. Dunham,
J. E. Root.

*Delegates to the Rhode Island State Medical Society.*

T. D. Crothers, F. E. Guild,
E. H. Davis.

*Delegates to the Medical Society of New Jersey.*

H. O. Allen, F. W. Wright.

*Delegates to the New York State Medical Association.*

W. H. Carmalt, J. R. Topping,
A. E. Abrams.

*On Medical Examination.*

J. F. Calef.

Objection being made to one vote for all the nominees, separate ballots were taken. Dr. Hill was elected President; Dr. Rienzi Robinson, Vice President; Dr. LaPierre, Assistant Secretary; Dr. Knight, Treasurer; Doctors Rodman, Abrams,

and Kimball, Committee on Matters of Professional Interest in the State. Objection being still made to a single ballot, a motion was made and passed that the Secretary cast a ballot for the remainder of the persons nominated, excepting for member of the Committee on Examination. They were elected. Discussion followed. A ballot was then taken for vacant membership of the Committee on Examination, and Dr. Calef was elected.

It was voted that a tax of two dollars be levied on each member of the Society and that seven hundred and fifty copies of the Proceedings be printed. Motions were separately made and adopted exempting from taxation Doctors A. A. Holmes, G. W. Burke and A. B. Worthington.

Dr. Shepherd said that there was a misunderstanding about the motion he made before, regarding the Yale Medical Journal. He intended to move that the entire matter be referred to a committee for consideration and arrangement of details, and he now moved that the question be taken from the table, that he might present the matter as he had previously purposed. The motion was lost. The meeting of the President and Fellows thereupon adjourned.

N. E. Wordin, Secretary.

# THE ANNUAL CONVENTION.

THURSDAY, MAY 23D.

The mass meeting was called to order by the President at 9:45 A. M.

The Secretary read his

## ANNUAL REPORT.

Your Secretary will have to present a more than usually uninteresting report this year. All the County Associations have celebrated their centennials and the Medical Practice Act has gone on its work quietly, even unassailed in the present Legislature. The Society seems in a harmonious and thoroughly prosperous condition. The County Clerks report meetings fully attended and quite enthusiastic. The program for to-day shows more papers prepared exclusively for the Society, unsolicited, than ever before. The subjects, too, are live questions such as are interesting not only the medical but the public mind of to-day. To the Secretary, standing at the pivotal point and looking in all directions, it seems as if the condition of medical affairs in our State as represented by this Society must continue to improve.

The past year has been uneventful and prosperous. We have gained in membership twenty-three, making our total 591.

This is distributed among the Counties as follows:

| | | | |
|---|---|---|---|
| Hartford, | 135; | a net gain of | 6 |
| New Haven, | 166; | " " " | 4 |
| New London, | 47; | " " " | 3 |
| Fairfield, | 111; | " " " | 9 |
| Windham, | 33; | " " " | 3 |
| Litchfield, | 41; | " " " | 1 |
| Middlesex, | 40; | " loss of | 1 |
| Tolland, | 18; | " " | 2 |
| | 591 | | 23 |

It will be seen that by much the larger gain has been in Fairfield County. Fewer members than usual have been dropped for non-payment of taxes. Last year the greatest number of losses (12) was from this cause. The losses this year are:

| | |
|---|---|
| Removed from the State, | 10 |
| Transferred, . . . | 8 |
| Dropped, . . | 4 |
| Withdrawn, . . | 3 |
| Died, . . | 6 |

There are fifty new members. There were forty-eight in 1893 and 1894. They are,

Franklin Lyman Lawton, Ph. B., Yale, '90; M. D., Yale, 1893, Hartford.

John Henry Rose, Univ. N. Y., 1893, Hartford.

John Bradford Waters, Univ. Vermont, 1890, Hartford.

Joseph Barnard Hall, Yale, 1892, Hartford.

Edward Oliver Elmer, P. & S., Baltimore, 1894, Hartford.

Janet Marshall Weir, Queen's Univ., Kingston, Ontario, 1891, Hartford.

Robert Moses Clark, Univ. Penn., 1891, New Britain.

Kanut Arvid Enlind, P. & S., Baltimore, New Britain.

Mary Starr Tudor, Women's Med. Coll., Phil., 1893, South Windsor.

James Albert Moore, B. A, Yale, 1892; M. D., Yale, 1894, New Haven.

Isaac Napoleon Porter, B. A., Lincoln Univ., 1890; M. D., Yale, 1893, New Haven.

Woodburne Rozelle Avis, P. & S., Baltimore, 1894, New Haven.

Ernest Herman Arnold, Yale, 1894, New Haven.

Robert Ellsworth Peck, Ph. B., Yale, '90; M. D., Yale, 1893, New Haven.

Charles Henry Brown, Univ. N. Y., 1893, Waterbury.

Edward Winchester Goodenough, B. A., Yale, '87; M. D., Yale, 1893, Waterbury.

Frederick Carl Goldstein, Yale, 1893, Ansonia.

George Hoxie Beebe, Univ. N. Y., 1878, Guilford.

Robert Hamilton McNair, Jefferson, 1890, New Haven.

Daniel Albion Jones, B. A., Yale, '84; D. M. D., Harvard, '89; M. D., Yale, 1892, New Haven.

William Charles Wurtemberg, Ph. B., Yale, '89; M. D., Yale, 1893, New Haven.
Robert J. Barry, Ansonia.
Charles Voorhes Butler, Univ. N. Y., 1893, Norwich.
George Maynard Minor, L. I. Coll. Hosp., 1885, Waterford.
Charles De Witt Voorhees, Univ. N. Y., 1889, Groton.
Harold Hankinson Heyer, Univ. N. Y., 1887, New London.
Edward Clifford Chipman, P. & S., 1871, Niantic.
Frank Terry Brooks, B. A., Yale, '90; M. D., P. & S., '93, Greenwich.
Charles Lincoln Banks, B. S., Lehigh, '89; M. D., P. & S., '91, Bridgeport.
John Joseph Kindred, Louisville Med. Coll., '89, Darien.
George Sherrill, P. & S., '91, Stamford.
Lauren Mellville Allen, P. & S., 1880, South Norwalk.
Fessenden Lorenzo Day, B. A., Bates, '90; M. D., Bellevue, '93, Bridgeport.
Howard Parker Mansfield, L. I. Coll. Hosp., '93, Georgetown.
Edward Everett Smith, L. I. Coll. Hosp., '71, South Wilton.
Edward Fitzgerald, P. & S., Baltimore, '83, Bridgeport.
William Francis Woods, P. & S., Baltimore, '93, Danbury.
William Sherman Randall, Ph. B., Yale, '83; M. D., P. & S., '85, Shelton.
George Skiff Ford, Bellevue, '93, Bridgeport.
Nathaniel P. Washburne, Ph. B., Yale, '87; M. D., Univ. N. Y., '91, Stamford.
Harry Shillingford Miles, Ph. G., '88; M. D., P. & S., '91, Bridgeport.
Watson Emmons Rice, Univ. Mich., '72, Stamford.
William Waldo Adams, Bellevue, 1891, Moosup.
Charles Joseph Le Clair, Victoria, 1887, Danielsonville.
Selden Burden Overlock, Bellevue, 1889, Pomfret.
James Fabien McIntosh, Victoria, 1887, North Grosvenordale.
Josiah Lovett, Univ. Vt., 1878, New Hartford.
Charles Ellsworth Bush, Yale, 1894, Cromwell.
Farnham Orris Bennett, Berkshire, 1859, Willimantic.

One or two interesting things are noted in examining this list. Eleven of the fifty have received some academic or scientific degree, an unusual proportion. And I believe that this would

be increased if County Clerks were more particular to obtain these facts. A large proportion of all our members who have the degree of B.A. are graduates of Yale. Of the medical colleges represented, it is found that Yale has eleven, the College of Physicians and Surgeons seven, the University of New York six. A study of some of these facts will show that the medical colleges are changing their status.

Death has dealt lightly with us. The oldest is Dr. Stephen Goodale Risley, of Rockville. He was a graduate of the University of N. Y., 1846, and joined our Society from Hartford County in 1848, having almost completed a practice of half a century. His activity as a member is shown in the fact that his name appears in no less than twenty-five numbers of the Proceedings as having some part in the meetings of those years.

Dr. William A. Lewis was much loved by the people of his portion of the State. His practice extended over into the western portion of Rhode Island. The Windham County Medical Association has expressed the high esteem in which he is held, in a series of very appropriate resolutions which it has asked to have printed in the Proceedings. He was a medical graduate of Harvard, 1851.

Of Dr. Wainwright it is more fitting that his biographer, Dr. Swasey, should speak. A genial companion, a large-hearted man, a skillful surgeon, he was cut down suddenly in the midst of his life work. Our meeting here to-day will lack something because of the absence of his earnestness, his vivacity, his hearty cheer.

The other three were, strangely enough, all from the same city, Waterbury, and had been with us but a few years. Dr. George Clifton Gay graduated in 1890 from the University of Michigan, Dr. Nicholas J. Hanlon in 1891, and Dr. Henry Smith Wildman the same year, from the L. I. College Hospital.

I can but call your attention to the variety of subjects presented for your consideration at our meeting to-day, betokening a continued interest in our Society and in the work of our great and ennobling profession.

N. E. Wordin, Secretary.

It was accepted and ordered printed.

Delegates from other societies were called upon.

Dr. Whitwell P. Small, of Great Barrington, responded first and said: "I have enjoyed exceedingly being with you and shall go away with kindly remembrances of the generosity of the people of Hartford."

Dr. J. A. Exton, of Arlington, New Jersey, said: "The State of New Jersey and its Medical Society have directed me to extend congratulations to the Connecticut Medical Society, and to invite you to its session at Cape May on the twenty-fourth and twenty-fifth of May. We take our members so far from their homes, that we may keep them under one roof and not have them wandering around the town. All our exercises are at the large hotel. I invite you all to meet with us at that time."

Dr. L. Duncan Bulkley said: "It gives me pleasure to extend to you the greetings of the New York State Medical Society, an organization older than your own. We are an active society. We shall be glad to welcome you at our annual meeting which is held in Albany on the first Tuesday in February. It gives me personal pleasure, too, to be with you, because I am a Connecticut man. My ancestors lived in your State. I have tried to come to your meeting before this but now I have transferred my citizenship to your State. Some one chided me on this, saying that I was trying to escape paying my taxes in New York. But a person pays taxes where his income is the largest, and I do not believe that, as yet, my farm in Litchfield County will yield me more income than my office practice in New York."

Dr. J. W. Gouley had "the honor to bear the greetings of the New York State Medical Association, a society considerably younger than yours. I invite you to its annual meeting on the second Tuesday in October."

Dr. Braman replied to these greetings, that it gives us pleasure to have with us those from other states. We trust that their stay with us will be pleasant and that they will be glad to come again.

Reports from Delegates to other Societies were called for—and first from the American Medical Association at San Francisco in 1894.

Dr. Shelton responded, stating that it was a year lacking three days since they started for the meeting. Their first objective point was the great inland city, Chicago. Here they found

various trains made up for the far west. They selected the one which they thought the best equipped for the purpose of carrying the Delegates, that which was known as the Association train, and it proved to be the best. The Connecticut delegation was small in number but they tried to make it large in influence. Doctors Lyon and Root with their wives graced the social part of the journey. The time spent in the transportation was delightful.

At Colorado Springs we were delayed by a wash-out on the road and had to take a long detour to the South. The consequent delay was so great that as we had on board the President, a number of the Vice Presidents, the delegations from Massachusetts, Chicago, and a portion of New England, we thought we would organize the American Medical Association on wheels and run it into San Francisco and proclaim that we were the Convention. But we reached our destination on the evening of June 4th. I was in time to attend the banquet of the medical editors of America. It was an assemblage of genial, spicy, entertaining, brainy men, at the Palace Hotel. The reception given by the people of San Francisco to the people of the East was beyond anything we had ever seen. Those at Richmond and St. Paul had heretofore been thought the best, but this far surpassed them all. Ladies formed the Committees of Entertainment, and the bowers of flowers, the attractions of the sex so fair, made everything surprising and delightful. In Convention your delegates secured a representation of Connecticut on the Nominating Committee in the person of Dr. Joseph E. Root, who did his best to secure a place for Connecticut among the Vice Presidents, but every arrangement of that kind was handicapped, for the gentleman from Michigan had chartered a train, loaded it with delicacies and fruits, invited his friends, entered the convention in strong force and captured the nomination. I have no doubt that the medical gentleman from Detroit acted well his part at Baltimore.

During the eight days we were on board the train journeying westward the entire party became pretty well acquainted. The ladies went from car to car making calls and receiving them with all the conventionality of home life.

In the contest over the code of ethics the majority report

was favored by the more liberal men, the minority by the hard-shell earnest men from the Empire State. The minority report was substituted for the majority.

Owing to the strikes and floods the members were unable to return and entertained themselves as best they could in Southern California. Unwilling to endure any of these we took steamer for Honolulu and spent two months at the Hawaiian Islands. The islands furnish the most delightful opportunity for a restful visit of any place in the world. Far away from patients one can have an absolute rest. I had an opportunity of learning from both sides the political situation of the island. The climate is delightful ; although in the tropics it is not hot. The trade winds temper the heat. The average for January is only eight degrees lower than in July and hence the islands are well adapted to pulmonary forms of disease. A trip to the great volcano Kilauea will well repay a visit. Here is a crater covering fifteen acres and a look at the seething, burning mass two hundred feet below is at the same time unearthly and grand. The prevailing disease is leprosy and here it can be studied in a most interesting way. I had the pleasure of being present at the examination of thirty lepers under treatment by a celebrated Japanese specialist who claimed to have cured those who had been diseased. The Board of Health, consisting of five, examines every case of suspected leprosy. The government spends ten per cent. of its revenue for hygienic purposes. It hunts up lepers and sends them to the station. No mistake is ever made. Every one of the five comprising the Board of Health gives his opinion and this must be unanimous. If there is one dissenting voice the suspect is kept under supervision. Lepers are confined on the government reservation for life and the government cares for them. This reserve comprises five thousand acres. The lepers have schools, marry and are given in marriage.

The trip to San Francisco and the side trips were of the pleasantest features of the Convention, and to be ever remembered.

The profession has some brilliant men in California. One of the best of them has just been elected President of the American Medical Association.

Dr. Wilcox, of New York, having been recognized, was called upon. He begged pardon of the Society for being late. "I am loth," he said, "to interrupt scientific work. For years I have read the Proceedings of your Society and for years have had friends in it. Two uncles of mine are at present members of it. In coming here to Connecticut I wish to extend to you my sympathy for the work you are doing in the elevation of the profession."

Dr. Root, resuming the account of the meeting in San Francisco, said: "Dr. Shelton, my pleasant associate, has so ably and well presented the subject that it would be better for me to say nothing, and as the hour is now late I will not say anything. But I am full of it and have already occupied two entire evenings in my account before the Hartford Medical Society.

The meeting was well presided over by Dr. Hibbard. There were fears that it would not be because of the anticipated strife and excitement over the code and the President was a man eighty years of age. But he made one of the best of presiding officers, was quick to apprehend and ready with his rulings, so that the contest over the code gave no trouble. The Sections were well attended. One reason for this was that they were all held under one roof and no entertainments of any kind were allowed during the hours of Assembly. Surgery, having the largest gathering, was held in the main hall. Dr. Roberts, the Chairman of the Section, made an able address on "Surgical Sins." Some of these were the overzealousness of operative surgery and the establishment of private hospitals where the physician rather looked upon his patients very much as a hotel keeper did his boarders.

In the Section on General Medicine the papers were all able. Apropos of the subject spoken of by Dr. Shelton, there was an exhibit of a colony of lepers before the Board of Health. This interests our country. Practically no cases originate here. They are all brought into the country.

The social entertainment was royal. All unite in saying that it exceeded anything in their remembrance. On Saturday they gave us an excursion to the Golden Gate. I had always supposed that the name was given to the locality because the discoverers found gold there. But really it is from the golden

color of the fields, the entire sides of which, forming the coast, are covered with a gorgeous yellow lily.

The incidents of the trip I shall never forget. A flood stopped our passage by rail and we had to sail sixty miles up the Colorado river. Houses were flooded, entire towns were submerged and the water was up to the top of the telegraph poles. At Yellowstone Park we were held up by strikes. Here we were delayed and I had an opportunity of examining the flora and of botanizing. I brought home three hundred specimens of plants.

From both a social and scientific standpoint it was a most enjoyable trip. It is to be desired that others would attend these meetings. One enjoyable thing is to see the leveling process which goes on during the discussions. Some noted man, a specialist, reads a paper and gives his dictum, and very quietly a country man, with no reputation or pretensions, will bring up something which will take him off his feet and floor him.

Dr. E. B. Lyon continued the report. The report of a meeting held a year ago would be an old edition, but this was a royal affair from beginning to end and lasted after the convention was over. It took me three months to get back home.

We were detained two days by an accident, four by fires, sixteen by floods, and twenty-three by strikes. The meeting at San Francisco was a very interesting one, but others have reported on that. The courtesies extended by all the people to the members of the medical profession were remarkable. And although it may never occur again, it is not among the lost experiences of a life.

One never can realize, unless actually on the grounds, what a twenty-three days' strike on the other side of the Rockies means. From June 27th to August 10th every hour we were under the escort of United States marshals and military. We left Monterey on the 27th of June and were escorted two hundred miles into the wilderness, not knowing whether we would be landed in the desert or ditched in the wilderness. We experienced the greatest hospitality from the medical profession everywhere we landed. We were the last train in and the first one out. The first train after us, manned by United States troops, was thrown into the river. Each car of one train had two regular soldiers

outside and fourteen to twenty inside. And we rode in this way until the 10th of August. No one was allowed to get off, not even to go to a restaurant outside the lines. Troops held possession of the towns. We stood on the bank and saw burned a bridge one hundred and sixty feet long and one hundred and fifty feet high. At Tacoma, going up the mountain, we collided with a freight train which the strikers had let loose after preventing the working of the brakes. The collision doubled up the train of thirty-five cars and threw them off the tracks. I used my experience as a railroad surgeon by getting out at midnight and amputating limbs by the light of lanterns on extemporized tables. The railroad companies extended courtesies on our journey, supplying us with all that was necessary for our comfort. The experience was one not to be forgotten.

In response to the call of delegates to the American Medical Association at Baltimore, the Secretary read a report from Dr. L. T. Day.

## REPORT OF DR. DAY

### TO A. M. A. IN BALTIMORE, '95.

*Gentlemen of the Connecticut Medical Society:—*

I attended the meeting of the American Medical Association in Baltimore, May 7th–10th, as your delegate, and among the Connecticut men there met Drs. Cassidy, Lowe, Mailhouse, Watson, Wile and Wilson. The Sections which I mostly frequented, besides the general ones, were those on Pediatrics and Diseases of Women.

In the Section on Pediatrics interesting papers were read by Drs. Louis Fischer and A. Campbell White of New York, on the Antitoxine treatment of Diphtheria, in which they extolled the virtues of the treatment, notwithstanding the adverse criticism of Dr. Winters. Several new antitoxine syringes were shown. In the Section on Obstetrics one of the best papers was by Dr. Howard A. Kelly, of Baltimore, on Suspensio Uteri. His method was exemplified by an operation at the Johns Hopkins Hospital.

Among the most interesting features of the meeting was Dr

Kelly's Hysterectomy operations at the hospital. I was fortunate in witnessing two, one for a large fibroid, which he removed in seven minntes, the other for carcinoma, removed in fifteen minutes.

Dr. Kelly also demonstrated catheterization of the female ureters, which he did before hysterectomy for carcinoma, leaving the catheters *in situ* during the operation as guides. The Sections were largely attended and a great deal of good work was done.

The Receptions were numerous and well attended, notably the ones at the Johns Hopkins Hospital and Music Hall. A prominent feature in the entertainment line was the excursion to Gettysburg on the last day of the meeting. Between three and four hundred availed themselves of the opportunity to visit one of the greatest battlefields in history.

Respectfully submitted,

L. T. Day, Delegate.

Dr. F. M. Wilson was glad to say that he was there and enjoyed himself very much.

Dr. E. H. Welch: "It was my pleasure to be able to attend the meeting of the New York State Medical Association through the kindness of this Society. It was a very instructive meeting. I noticed one difference between their meeting and ours here. Every one started off sharp at the hour called whether three were present or not. It would be a good idea for us. Among the many papers the one which interested me most was on the prevention of tuberculosis, by Dr. Gray. It was ably discussed. The main point I want to speak of is that we ought to be particular in following up our State Board by reporting cases. The meeting was kept up to the mark. Socially I met personal friends and of course enjoyed it.

No other delegates responding, Dr. I. W. Lyon presented the first part of his Report of the Committee on Matters of Professional Interest in the State, Typhoid Fever.

Dr. Carmalt made a motion which was passed, that after dinner the first time in the session shonld be given to discnssing the papers on typhoid fever.

The hour of twelve having now arrived, President-elect

Hill took the chair and Dr. Braman read the President's Address, "Medical Sociology."

An adjournment was made at 12:30.

THE AFTERNOON SESSION

convened at 1:30 P. M.

Discussion on typhoid fever being in order, Dr. Bacon said he did not like to speak in place of his superiors, but in absence of any other remarks he would say that one of the most valuable suggestions in regard to typhoid fever has been made by Dr. Hall. It is valuable because practical. The theoretical advantages of the Brand method are recognized but really they are not practicable except in some households. To lift in and out of the bed and the tub the patient, weak and exhausted by fever is to work at a great disadvantage. With children this is not so marked. This method, however, has advantages which will make it of marked use even with adults. It is to be remarked, too, that it comes to us from a man just beginning practice. The method can be used in almost any household without lifting or carrying the patient. This is a great advance over the old ways. There are advantages in the use of hydrotherapy which cannot be secured in any way better than by that of Dr. Hall.

Dr. Donaldson inquired if any one could give information about the epidemic of typhoid fever in Stamford. It was a subject which was interesting many.

The Secretary said that the epidemic was being investigated by Prof. Smith. When the cases were located on a map one could easily trace the route of the milkman whose milk was the source of the disease. It probably came from the water used in washing the cans, not in diluting the milk, because persons had the fever who took such milk as this man brought, not alone what came from his own farm. The water supply was a well very badly situated. It was at the foot of a hill, in a thickly settled portion, with privies around and near by was a roadway where tramps frequently passed and where they frequently relieved themselves.

Dr. Carmalt hoped to bring out the views of men who had seen epidemics of typhoid fever. He expressed great admira-

tion for the care shown by Dr. Lyon in the preparation of his paper. It was worthy of commendation. The surgical treatment had been brought out by Dr. Wiggin. The condition from perforation caused by typhoid fever is not different from that caused by appendicitis, excepting that in the former the patient has been sick some time and is physically below par. But the local conditions, the conditions of perforation, appear the same. We are able under such circumstances to occasionally save a case. So is it here. It is then the bounden duty of the physiciau who has such cases to be on the alert for the complication we are considering. Let him tell some surgeon that he may be ready at the critical moment; let him explain to the friends that they may be prepared. The operation is little more—it is no more than for appendicitis and we do have recovery from cases of perforative appendicitis. With our present knowledge we would be derelict to let these cases die without relief. Without relief he is doomed to die, according to the statistics. Haste is of great importance in these cases. If there is great prostration, would it not be allowable to make an artificial anus for the time. Let the fecal matter out of the abdominal cavity aud protect it. We may save life by a short operation.

I am gratified to hear the result of the bathing system used in the Hartford hospital and so well showu by Doctor Hall. It is a great advance over former methods, that it can be done in bed. This will do much to recommend it to the laity. People object to the shock of taking the patient out of bed and puttiug him back. Injury has been done from shock and there is much kicking against it. The system has beeu used in Roosevelt hospital, but not with the detail here described.

A case showing what might have been done in the way of surgical relief is that of Mr. D——, given by Dr. Rankin in his paper. There opening the abdomen would have given the woman a chance for her life. It is unfortunate that she was not given a chance for operation.

Dr. Rankin: The cases were not mine. They were all out of my range. Mr. Dixon had been improving. Perforation occurred in the evening and I was not notified until morning. If there was ever a chance to save a man, he might have been saved.

The second part of the report of the committee then followed—Antitoxine in Diphtheria. Before reading his paper Dr. Wolff showed the tubes used by the Board of Health, of Hartford, in diagnosing diseases of the throat. They were test-tubes, used for distinguishing between diphtheria and pseudo-diphtheria. The tubes were placed in all the drug stores of the city and whenever any physician wished for a diagnosis he procured a set of them. One contained sterilized blood-serum for the growth of the bacteria, the other contained a sterilized swab. The swab was carried into the patient's throat and rubbed around. It was then rubbed over the serum in the other tube and destroyed. The plug was returned into the mouth of the tube which was then left at the drug store and collected by the Health depart ment. After twelve hours under a temperature of 98.5% F. the tube showed a growth of the Klebs-Loeffler bacillus pure or a mixture of the streptococcus and staphylococcus. Dr. Wolff immediately followed with his paper.

The paper of Dr. Lyon on Antitoxine in Diphtheria finished the report of the Committee on Matters of Professional Interest in the State.

The report on the Progress of Surgery was next read by Dr. L. W. Bacon, Jr.

Dr. Wilson followed with the Dissertation, Senile Cataract, One Hundred Operations, Comment.

The reading of the papers upon the program was then begun and the following were presented:

Pneumonia and the Treatment of Its First Stage by Stimulation, by Dr. W. J. Tracy, Norwalk.

Tetanus, by Dr. E. B. Lyon, New Britain.

After he had finished Dr. Donaldson remarked that much was lost in not having a discussion on the topics presented. He narrated a case of tetanus in the Brooklyn hospital, while he was an interne. It was real tetanus, caused by the wound of a nail. There was recovery.

Dr. Lyon wanted to know if the bacilli of tetanus were found.

Dr. Donaldson said it was in 1881, before the days of the microscope.

Dr. Keniston read a paper entitled A Case of Acute General Miliary Tuberculosis, of so-called Typhoid form.

Two surgical papers followed, the Localization of Intestinal Obstruction, by Dr. W. S. Maclaren of Litchfield, and Observations on Operations for Radical Cure of Hernia, with report of cases, by Dr. George C. Jarvis of Hartford. The other papers were called for by title, but no writers appearing, they were referred to the Committee on Publication.

The meeting adjourned at 5:40.

The supper was served at the Hotel Hartford at 8 o'clock. About eighty persons enjoyed the occasion exceedingly.

# PRESIDENT'S ADDRESS.

# PRESIDENT'S ADDRESS.

MEDICAL SOCIOLOGY.

*Gentlemen—Members of the Connecticut Medical Society:*

Among the more important obligations one takes upon himself on entering the medical profession, is that of advancing its general good.

Happily, his field of operation is extensive and diversified, limited in its possibilities only by physical and mental capacity. Medical Science touches humanity at every point, allowing the conscientious physician to consult his own inclination in the choice of that branch of practice best adapted to his ability and taste. This freedom of choice in special work with professional comity ensures natural association upon an ethical basis. Such an association is the most effectual means that can be employed to increase the profession's influence and power, as well as to insure its recognition in all directions in which it has interests. Consequently, the standing of the individual physician in the community in which he lives is measured largely by the general standing of his fellows; while, on the other hand, it is maintained by eminent authority that the estimation in which medical science is held is an accurate measure of the intellectual advancement of the community. The ultimate aim of all the learned professions is the development and elevation of man in his entirety. Blackstone says that, "the true and natural foundations of society are the wants and fears of the individual." This statement made by the great apostle of law is most apt and conclusive. Legal enactments are required to secure the inherent and natural right of the individual, while medicine is, and always has been a necessity,—the satisfying of physiological demands, and not the gratifying of nice or fastidious tastes.

As a science it is recognized as being the art of preventing, curing, or alleviating the diseases of the human body,—the power by which the conditions controlling generation, growth

and development as well as decay is changed, while the practice of the science involves the application of the principles of the different branches of medicine to science, to ethics and legislation. Until quite recently, however, the time and strength of the profession has been largely devoted to the development of science for its own purposes, and but little attention to that which may be strictly denominated medical politics, or the fulfilling of its functions as a prime factor in human government. Early tradition as well as Ancient History bears tribnte to the fact, that at times the good order of society conld not have been maintained without invoking its aid and snpport. And yet, governments have not always recognized the paramonnt importance of this science, or its vital significance and great valne in securing their highest interests. In calling yonr attention to some of the social aspects of medical science, I will first cite its achievements on mission fields in the development of civilization. It is an accepted fact that in Christian lands alone medicine is a science and beneficence; that its devotees are exemplars of Him—

* * * "who went about
The Syrian hill-paths doing good,
And casting devils out."

With the remarkable account of His journeyings so vividly set forth in the writings of St. Mark, and the wonderful story of those Apostles who prefaced their work with a miracle of healing, is it not inexplicable that the church shonld for centuries fail to appreciate the undonbted efficiency of the relief of physical suffering as an evangelistic agency, and that it has more potency in winning the untntored mind than either exhortation or sermon? During the first century Christian philanthropy was manifested in the construction of a hospital for the care of the indigent and unfortunate. The world had never seen its like before. It was founded by Fabiola, and located in the city of Rome. In other than Christian lands the healing art in the hands of priests is a shocking medley of superstition and cruelty. The history of Medical Missions has never been written. All our information is fragmentary, and yet there is snfficient available data to warrant the assertion that there have been no more brilliant victories for humanity than those along this line. In 1636 Dr. Gabriel Boughton became the physician in attend-

ance upon a princess in the court of the Great Mogul of India, and it is a fact but little known that the successful treatment of that case opened that vast Empire to the possibilities of English civilization, the only fee asked being leave for his countrymen to enter India. Sixty years ago Dr. Peter Parker made possible to China the benefits of Christian philanthropy by the establishment of an Ophthalmic hospital in Canton. In 1887, near the gates of old Foochow, a hospital was opened by Dr. Sigourney Trask, and successfully conducted by him and other male and female physicians. To the present time the work has always been greater than the ability of the medical force to perform.

The hospital first built overflowed its own walls and rooms, and adjoining residences were occupied, and still the demand for room increased until 1890, when the walls of another hospital rose to completion. In 1891 the record shows that there were 6,215 patients taken care of in the hospitals, and 1,088 out-patients visited. In 1893 the total number of patients was 6,470 treated in hospital and 1,320 out-patients. The one dispensary opened just previous to the first hospital became two, then three, until now there are six within and without the gates of that ancient city. Early in the eighteenth century General Cadington, an Englishman, a patron of the Society for the Propagation of the Gospel, bequeathed a property in the West Indies to that society for the founding of a Medical and Theological School, so that by the ministration to the sick and afflicted, the students and graduates might win the obdurate and endear themselves to the people.

Ten years ago Dr. Allen, of the American Presbyterian Board, cured the Princess Royal of Corea of a severe and painful wound. Since that time the benighted people of the "Hermit Nation" have favorably received and entertained the hitherto hated foreigner. Dr. Elmslie, by opening a hospital in which to care for and relieve suffering humanity, opened Cashmere, heretofore closed to every blandishment of commerce. But neither time nor space will allow of details. The name of Dr. Peter Parker, who in the face of bigotry and ancient superstition, opened the gates of the Celestial Kingdom "at the point of the lancet," never more to be closed to western enlightenment and culture; of Drs. Ruffner and Hocker who, after securing a

like blessing for Ispahan and Egypt, died knocking at the gates of Abyssinia; of Dr. Vander Kemp who, in 1798 at the behest of the London Missionary Society, entered South Africa as a pioneer, acquired the Kaffir tongue and became so enraptured with the service that he gave himself wholly to the elevating and uplifting of the people about him; of the magic name of Livingstone, who as a physician penetrated to the heart of the dark continent, became lost to the world, and laid down his life that hitherto unknown tribes of men might know and see the light, are suggestions of noble deeds. It is not necessary to cite cases to prove the truth that philanthropy is the soul of medicine, and that physician is synonymous with love of mankind or universal good will. There is great significance to be attached to the fact that The Man of Galilee numbered among his apostolic household a physician. Some of you may have been present and recall that impressive scene in Washington during the meeting of the International Medical Congress in 1887, when one morning just before the convening of the general session, Alexander, son of the late Sir James Y. Simpson, of Edinburgh, Scotland, in the midst of a throng of medical men, representing nearly or quite every nation on the globe, said, "Gentlemen, allow me to present to you a copy of the writings of a physician of the first century." It was the Gospel of Luke, new version.

Naught but the love of mankind could have induced him to convey across the Atlantic that unique souvenir. The following selection is a singularly appropriate exhortation to physicians on Mission fields.

> "Go, tell the things ye hear and see to-day,—
> The blind, lame, dumb, that see, and hear, and pray,
> The poor that hear the Gospel! Thus he said.
> Christ walks no more Judean plain and hill,
> Yet do sick souls in painful bodies pine,
> And, far and near, the poor are with us still,
> O, blessed touch, that proved the hand divine,
> Thy virtue share! Can we forget his word,
> "Not greater is the servant than his Lord?"*

Another aspect of this subject is that which relates to law. Forensic medicine is without doubt one of the most important,

* In His Name, by Mary A. P. Stansbury.

as well as one of the most imperative branches of the science. Important, because of the diversity of interests involved, the responsible nature of the service required, and the high order of culture necessary for the rendering of opinions unbiased, founded on science, and dictated by common sense, discretion, discrimination, and good judgment. It is only after years of close application that one is fully able to comprehend the responsibility involved in medico legal practice, and is really prepared to render valuable service in Courts of Justice.

And yet, none can escape the responsibility. Necessity does not make nice discrimination as to kind or length of practice, or convenient seasons. Upon the general practitioner devolves the larger portion of this exacting work, and early acquaintance with its demands is imperative.

The first call may bring one face to face with a medico legal case requiring all the thought, the keenness of observation, knowledge of facts, and ability to draw conclusions of an expert. And yet, being first called, one has first knowlege of the facts, of the symptoms, of general appearances and surrounding conditions. With these advantages one must recognize and accept the responsibility, for in the majority of cases the burden of proof will rest on him alone.

It is not my intention, however, to discuss the educational requirements of physicians, or the process of law, evidence, signs or causes of death or personal identity, but rather to emphasize the dependence of law upon medical testimony in securing justice in all medico legal cases.

This whole system of practice is based upon the scientific application of the principles and practice of the different branches of medicine in doubtful questions in courts of justice.

Numerically it is not in my power to cite the number of such cases in this State occurring in a single year. It is not required, but one can get a fair conception of the magnitude and extent of this service by a few moments of reflection. For there is not a "bridge of sighs," a doubtful or untimely death, a case of infanticide or homicide in any of its varied forms, or mental unsoundness of whatever nature or cause that may not lay claim to the general practitioner's mental acumen and scientific equipment. Fortunately medical science has been making rapid

progress in the etiology and pathology of diseases, in no department more rapidly than in those of a mental or nervous character. I think it is within the memory of some members of this Society that the causation of insanity was not sufficiently understood to enable the profession to completely divorce this purely pathological condition from the inherited, or traditional theological notion, that insane manifestations were in some way due to the presence of an evil spirit, or to the enslavement of the soul by sin, or to prevent empirical pretenders with a boldness transgressing the bounds of modesty, from proclaiming the treatment of mental diseases to be a special art, thus enabling them for a long time to hold the mentally indisposed quite aloof from general medicine in a "mysterious and mischievous isolation." It was a glad day for the sufferers and for civilization when the transition came and pretense was superseded by the intelligent application of the resources of rational medicine to the alleviation or cure of the bodily ills of the mentally indisposed.

It is now generally conceded that all mental manifestations take place through the nervous system, and that all exaggerated mental phenomena are the result of some functional or diseased condition of the nervous system, and subject to the same methods of investigation as other nervous diseases. Mental science stands on a higher plane to-day because of its earnest and untiring effort to understand the human body, its organs and their functions. The secrets revealed by pathology have shed light upon hitherto unintelligible phenomena, which cannot be better expressed than in the language of Dr. Maudsley in "Pathology of Mind." "Good moral feelings are to be looked upon as an essential part of a sound and rightly developed character in the present state of human evolution in civilized lands. Its acquisition is the condition of development in the process of humanization. Whosoever is destitute of it is, to that extent, a defective being; he marks the beginning of race-degeneracy, and if propitious influences do not chance to check or to neutralize the morbid tendency, his children will be actual morbid varieties. Whether the particular outcome of the morbid strain shall be vice, or madness, or crime, will depend much on the circumstances of life; but there is no doubt in my mind, that one way in which insanity is generated, de novo, is through

the deterioration of nature, which is shown in the absence of moral sense.

It was the last acquisition in the progress of humanization, and its decay is the first sign of human degeneracy. And as absence of moral sense in one generation may be followed by insanity in the next, so I have observed that conversely, insanity in one generation sometimes leaves the evil legacy of a defective moral sense to the next. Any course of life, then, which persistently ignores the altruistic relations of an individual as a social unit, initiates a degeneracy, which may issue in mental derangement in his posterity."

If these principles of neurology be true, and I hardly think any will question, we are furnished with a foundation, physiological in character, which will not only enable us to comprehend the peculiar characteristic changes which take place in the degeneracy of the nervous system, but to judge somewhat as to the order of degeneracy, its bodily circumscription, and methods of treatment in general. Intellectual, moral and emotional perversions of the mind are symptoms of impairment or degeneracy of the nerve-centers of the brain, either from acquired habit, transmission, or hereditary influence. Another nervous disease akin to insanity is inebriety or alcoholism. The diseased relationship is intimate and many-sided; in the family history often found to be interchangeable. I will not weary you with details of the symptoms of this continuous epidemic disease, if I may be allowed to use the term, but rather refer to its influence in the causation of other diseases and the phenomena of its effect upon the system. Alcoholic excess is the most frequent single cause of mental disease, and very often a predisposing cause.

Statistics gathered from various accredited sources show that more than forty-two per cent. of the cases of insanity developed during the active or work period of life, were those in which alcoholic excess was either the predisposing or exciting cause.

Indeed, alcohol is the most common of all causes of insanity. Nearly one-half of the cases of alcoholic insanity are suicidal. From fifteen to twenty per cent. of all mental diseases are due to alcohol wholly or in part.

It has also been found upon careful investigation that a large proportion, nearly fifty per cent., of all idiotic cases are the off-

spring of intemperate parents. Facts like the above are unquestionably appalling to contemplate, especially when (quoting reliable authority), it is true that our present day social environment is unjustifiably drunken in its tendencies, so that an inebriate without some one to exercise strong control, whether he be rich or poor, will find his position to be well nigh, if not absolutely hopeless.

Time will do its work and the strong will survive. But the Christian philanthropy of our day is opposed to the survival of the strong and the elimination of the weak. Insanity is the result of disease in the supreme nerve-centers, so is chronic alcoholism. As physicians we understand its etiology. Some of you with zeal and great ability are putting forth herculean efforts to improve the condition of those suffering from this disease. You build asylums for them and by isolation, good nursing and proper treatment restore them perhaps to sobriety, family and home. This you do not only seven times, but perchance seventy times seven, inasmuch as his inheritance is non-transferable and his surrounding social conditions unmodified. The time has come when this blot upon our social life, and upon our Christian civilization and culture demands, and, I am glad to say is, to a certain extent, receiving attention, not only from philanthropic reformers, but also from some of the best minds in the medical profession. Our legislatures are besieged by would-be reformers with more zeal than discretion, asking for the modification of existing laws, for the closing of the saloon at twelve o'clock Saturday night and not opening again until twelve o'clock Sunday night, for the removal of all obstructions from windows, etc., expecting thereby to lessen the evil effects of alcohol upon the system or cure the disease.

In this State the asylums for the insane, the inebriate and the epileptic are increasing in number every year; the financial resources of the State and the philanthropist combined are hardly sufficient to supply the demand for treatment. Has all this expenditure of money for buildings, for equipments, for board and treatment, ever prevented the occurrence of a single case of alcoholism or insanity? It may be a homely comparison, but to my mind, the asylum treatment of the drink habit, though it is most assuredly humane and may bring comfort to many a home

for a time at least, is as futile in stopping the progress of intemperance as the attempt to bail out a smack's well without stopping the holes at the bottom. It will interest and amuse the lookers-on and keep the bailers busy, but the well will remain full. As I said before, the medical profession is alert. It understands the manifold interests involved in the traffic as well as the nature of the disease which it develops. The contest will be long and desperate, and if the cause of the disease is ever removed, it will be through popular education and enlightenment by the medical profession at large, supported by sympathetic legislation.

Health legislation is another phase of Medical Sociology, and one as yet but little understood, although the educational process is at work. An eminent author on public health says that "when we examine the amount of knowledge as to the cause of disease actually possessed by the immense majority of the fairly well educated and intelligent people, and see how much is mere vague conjecture, untested theory, and baseless estimate, and above all, how hopelessly unconscious they are of their own ignorance, and how confidently they will undertake to advise as to what should or should not be done to prevent cholera, yellow fever, or any other disease whatever, we cannot wonder that the public at large is confused by the contradictory assertions made to it, and hesitates as to what should or can be done in the matter. There is most assuredly need of more light."

The past is an open book. It can be read by physician or layman and neither need go astray. The example of Moses codifying empirical rules of health, whether formulated by himself or gathered from Egyptian or other civilizations, and adapting them to the requirements and exigencies of both fixed and nomadic life, is an exhibition of profound wisdom and consummate statesmanship, challenging our admiration and respect. But the fact would be of little account historically were the result of the enforcement unknown. The severest test of a law is its enforcement. Judged by this standard the worth or worthlessness of State medicine has been tried, and the fact that the Jews, as a race, have enjoyed remarkable immunity from epidemic diseases for more than three thousand years, while surrounding nations, boasting of more advanced civilization, have been ravaged by them, is an incontrovertible proof of the

value of rigidly enforced sanitation. He was not only the benefactor of his own race, but of all mankind. Correct rules of health never change. The enforcement of them among Jews, Greeks or the barbarians will insure the same results. With us wise legislation is required, both State and National, in the direction of the prevention of disease. Such legislation would prove to be economic, for if we accept the conclusions of recognized authority on political economy of health, it can be shown that the direct financial loss to the country, caused by non-protection of the people against preventable diseases and mortality, exceeds $100,000,000 annually, not including the necessary expenditure on account of sickness or loss of life, and injury to commerce due to extensive epidemics.

Institutes of political economy usually attract the average legislator, and yet with the knowledge of the wonderful exemption of the Jews from the ravages of epidemics and preventable diseases, as well as the pecuniary loss to this country on account of the non-protection of the people against preventable diseases, where is the legislator or statesman who, of his own volition, would think of espousing the cause of the people in this matter?

The subject is of great magnitude and touches every phase of life, whether in city, town, or hamlet. I believe the proper protection of the people can never be secured until the place and power of medical science be recognized at the seat of government in Washington, by the creation of a Department of Public Health, the executive of which shall be a secretary clothed with the power and prerogatives enjoyed by other cabinet officers and enforced by constitutional amendment if need be, under whose supervision and direction, not only the reports of the sanitary conditions of all ports and places within the states and territories, but also reliable information shall be rendered to the profession and people, regarding the dangers of infection from town or city ownership of school-books, epidemics and degenerative diseases, the transmissibility of insane, alcoholic, nervous and malignant types of constitution to offspring, and the prevalence and ruinous effects upon the body and mind, of intemperance.

Then the true doctrine that "medical science is a part of the common law of the land, and is to be treated as such," will be recognized and respected.

# DISSERTATION.

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# SENILE CATARACT.

ONE HUNDRED EXTRACTIONS.

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# COMMENT.

# SENILE CATARACT—ONE HUNDRED EXTRACTIONS.

F. M. WILSON, M.D., BRIDGEPORT.

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The late Frederick Douglas once said, "That he never made a short speech that he was satisfied with himself, and that he never made a long one that anyone else was satisfied with."

As your annual Dissertator, I am under obligations to satisfy you by brevity, but, on the other hand, this Society is somewhat in arrears to our subject.

During its existence of more than a hundred years, the Connecticut Medical Society has left a somewhat voluminous record, but in that record is no trace of any paper or address upon the subject of Cataract, and if we accept the terse summary of Doctor St. John in our Centennial year, only a few slight references to the word, so that we really *do* owe our subject something, and as payment in full is out of the question, the next best thing is "a small deposit upon account."

The crystalline lens is a weak part of the human body. No other part loses functional power with so great uniformity in early life. At ten years of age the child with normal eyes can see small objects distinctly at two and two-thirds inches from its eyes. At fifteen years of age the lens is a little harder and the near point is a little more than three inches from the eye. At twenty years it is a little less than four inches away. So that even from childhood to adolescence, while all the other powers of the body are increasing, molecular changes are going on in the lens, which lessen its range of accommodation. These changes go on and on, the near point constantly receding, until at the early age of forty-five, it is far enough away to be inconvenient, and then almost the entire human race requires artificial help to see small objects close at hand. This hardening of the lens is usually described as a physiological process, but we must not forget that it is a defect, a defect in durability, a part which

wears out while the rest of the body is still in its prime. Pushed still further, this hardening produces a condition sometimes known as the "senile lens," and characterized by slight lack of transparency. If we carry the sclerosis still farther we have pathological disturbance of lens fibres and opacity, i. e. Cataract.

But this pathological disturbance of the fibres of the lens, though far more common in the later years of life, may occur at any time, from infancy to old age. It is much more frequent than would appear from recorded operations. During the same period from which the one hundred extractions reported to-day were taken, my associate, Dr. H. S. Miles, has found in our records between five and six hundred cases of incipient cataract; some of them of course come to operation later, but on the other hand, a respectable minority do not, but remain stationary, or progress very little in five, ten, or even fifteen years.

The past must not delay us long, but let us take a hasty glance. The original operation for cataract was to thrust a needle into the opaque lens and push it out of the axis of vision into the vitreous. The initial results were brilliant, but the dislocated lens, acting as a foreign body, subsequently destroyed so many eyes, that it was entirely given up. Some of these loose lenses accidentally found their way into the anterior chamber and were successfully extracted. This led to extraction of the undisturbed lens. Then came the Beers' knife and the so-called "flap extraction." This triangular knife was pushed across the anterior chamber, severing at a single thrust half the circumference of the cornea; sometimes the upper half, sometimes the lower, and through this wound the lens was pressed without iridectomy. The most potent objection to this method was the frequent sloughing of the flap. Then came Graefe with the narrow knife and linear section, partly in the sclera and partly in the cornea. This, combined with iridectomy, came to be known as "Graefe's Method." Many operators modified this a little, and the phrase "Graefe's Modified Method" came into use, and it was jokingly said that "'Graefe's Method' was so much modified that nothing was left of it but the knife."

Preliminary Iridectomy was in vogue a few years ago, but is not done much now.

The most radical change in recent years is a partial return to this old "flap operation," without iridectomy. But a "flap operation" with a smaller flap, and done with a Graefe's knife, is a very different thing from the old flap operation and has yielded in skilled hands almost ideal results. It has come to be known as "simple extraction." In briefest outline these are some of the more important changes in operation methods.

What, then, is this operation called "simple extraction"?

First.—*The Incision :*

Most operators do not include selera in the incision, thus keeping farther away from the ciliary body.

Most operators keep near the margin of the cornea, thus keeping nearer to the blood-supply, the cornea having no blood-vessels.

Most operators include more than one third and less than half the circumference of the cornea in the incision.

Most operators use their own modification of Graefe's narrow knife.

Most operators make the section upward.

Second.—*The Capsulotomy .*

Too little attention has been paid to the capsule of the lens. It has been scratched and torn in all directions, pieces of it removed with forceps, etc., apparently with perfect impunity. It seems probable that it ought to be cut with the sharpest possible capsulotome and in the most careful manner; that it is a very considerable factor in the success or failure of cataract extraction.

Third.—*The Expulsion of the Lens :*

As the head of the fetus should stretch the perineum slowly, so the lens should stretch the iris slowly. From a purely mechanical standpoint, manipulation with the fingers and lids alone, without instruments, is by far the superior method, but from the bacterial standpoint I am afraid it is unwise.

When all goes well, when the incision is just near enough to the sclera so that the scar does not show, when the incision is

just large enough for the easy expulsion of the lens, when the minimum amount of violence is done to the iris and capsule, when a central movable pupil is secured, with a fairly close approach to normal vision, we have a bit of ideal surgery well worthy the many years of operative work which it has taken to produce it.

Next. What should be the attitude of the ophthalmic surgeon toward the bacterial army which infest us? We have here a rather peculiar condition of things. In the first place cataract extraction was a highly successful operation before anything more than that indefinite thing called "ordinary cleanliness" was practiced.

In the second place, the average loss after cataract extraction is very little better to-day than before the introduction of antibacterial measures.

Ophthalmic surgeons have stood by and seen changes introduced into general surgery, which fully justify the word revolutionary, and all through knowledge of pyogenic bacteria and their habits.

Almost every clinical picture of suppurative inflammation in the human eye can be produced by inoculation of pure cultures of these bacteria into the eyeballs of animals.

Experimenters in many countries, one of them in our midst, Doctor Foote, of the Yale laboratory, have proved that the healthy conjunctival sac is the habitual home of pyogenic bacteria. These facts come from three sources. From the laboratory, from general surgery, and from clinical ophthalmology. The laboratory and general surgery have so joined hands that many operations have come to be, as one writer aptly puts it, "only experiments in bacteriology," the most vital point being whether a certain number of bacteria get in or stay out.

The records of clinical ophthalmology see most how this,—that the introduction of Graefe's knife with the combined method of extraction, was followed by a distinct lessening in the number of eyes lost after cataract extraction, but that no such change can yet be traced to the introduction of antisepsis or asepsis, the average percentage of loss being nearly the same

before their introduction as now. These statements are based upon these records of a little more than thirty thousand cataract extractions. Two tables of ten thousand each, all done before 1878, were published by Doctor Noyes in 1879, and my associate, Doctor H. S. Miles, has just finished a third table of ten thousand cases operated upon since that time. Laboratory studies in bacteriology and laboratory experiments upon the eyes of animals have become so numerous and by so large a number of observers, as to furnish a constantly increasing volume of evidence that of the eyes that *are* lost after cataract extraction, a certain proportion of them are lost through the presence of bacteria inside the eyeball. Indeed, the power of bacteria to produce destructive inflammation, after they get inside the eyeball, can hardly be denied. In the presence then, of a clinical record demonstrating a small average percentage of loss, after cataract extraction, we have to inquire why the bacteria do not get in? And we have also to inquire why they *did not* get in in the earlier years before the words "dirty" and "clean" were displaced by the more scientific terms "septic" and "aseptic"?

The principal sources of wound contamination are, of course, here as elsewhere, three:

First.—The Instruments.

Second.—The Hands.

Third.—The Field of Operation.

Theoretically, the instruments and hands of the ophthalmic surgeon should be as sterile as those of the general surgeon. Practically, the danger of infecting a cataract wound by instruments or hands, is less than almost any equally important operation of general surgery. The instruments are few in number, and with the exception of the knife, only the tips of them are brought in contact with the wound, and the hands of the operator do not need to be brought in contact with the wound at all.

The field of operations in cataract extraction presents insuperable obstacles to sterilization. The loose folds of the skin of the lids are hard to deal with. The edges of the lids around the roots of the lashes cannot be rendered even approximately

sterile. The conjunctival sac cannot be entirely freed from bacteria, and after all our efforts and the dressings are on, there still remain the lachrymal passages in free communication with the nose. It would seem then from the bacterial standpoint alone, as if the cataract wound *must* be infected often from the field of operation. But our clinical record says that it is exceptional and also that it *was* exceptional, even before the days of surgical bacteriology. We are then forced to the conclusion that the cataract wound is in some natural way protected to a certain extent against the bacteria of the field of operations; that we are dealing with an operation in which the danger of infection must be less than usual, or it could not have been done with such high measure of success in the older days, when the enemy's name was "dirt" and not "bacteria."

Mechanical conditions help to keep the bacteria outside the eyeball and away from the wound. So long as any portion of the wound remains open there flows out through it a gentle stream of aqueous humor. The lachrymal gland furnishes a constant gentle stream of tears from above, downwards over the front of the eyeball, and away from the wound. Both fluids also have a mild bacteriacidal influence.

When a cataract dressing is removed for the first time, the bulk of whatever has accumulated in the conjunctival sac is found between the edges of the lids or on the dressing, and not in contact with the corneal wound. Both fluids also have a mild bacteriacidal influence.

In conclusion, to briefly summarize this part of our subject: It is comparatively easy to prevent infection of cataract wound by hands or instruments, but it is practically impossible to sterilize the field of operation. But the word aseptic is gradually coming to mean "free enough from bacteria so that healing takes place kindly," and in this sense something can be done to render the wound aseptic, for undoubtedly some of the bacteria can be removed and some of them killed, even by the mild solutions necessary about the eye, and quantity here, as elsewhere, plays an important part. Very few ophthalmic surgeons, whatever their views upon sepsis or asepsis, like to operate in the presence of enough bacteria to irritate the conjunctiva or lachrymal sac.

Two other causes may produce inflammation after cataract extraction:

First.—Too strong antiseptics.

Second.—Mechanical violence.

Even in general surgery it has been found better, when possible, to remove the bacteria than to try and kill them by strong solutions, and chemosis of the conjunctiva, inflammation of the cornea and when the solution gets inside the ball, inflammation of the iris also, are some of the results due to the indiscreet use of antiseptics. Mechanical violence also is an important factor and may of itself produce sufficient disturbance to destroy sight. More often, however, by bruising tissue, it furnishes an opening for the invasion of bacteria.

| Name. Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| Mrs. Catherine D. No. 1 (Left) | 66 | 7 years | Soft cortex. | Prelim. Iridectomy and 8 weeks later extraction under ether. | Normal. | 15 days | $\frac{2}{7}\frac{0}{0}$ | ..... | $\frac{2}{3}\frac{0}{0}$ | Friend reports "kept her sight to day of death," 13 yrs. later. |
| Herman E. No. 2. (Left) | 41 | 1 year | Small portion of lens still transparent. | Prelim. Iridectomy and 8 weeks later extraction under ether. Hemorrhage into ant. chamber. | Vomiting. Iritis on 4th day, lasting 15 days. | 4 weeks | $\frac{2}{5}\frac{0}{0}$ | ..... | $\frac{2}{3}\frac{0}{0}$ | ..... |
| Henry T. W. No. 3. (Left) | 71 | 8 months | ..... | Prelim. Iridectomy and 3 months later extraction under ether. Considerable soft cortex left in capsule. | Normal. Cortex slow in absorbing. | Under observation 3 months | $\frac{2}{4}\frac{0}{0}$— | ..... | $\frac{2}{4}\frac{0}{0}$— | 6 yrs. later l.v. $\frac{2}{7}\frac{0}{0}$ |
| Mrs. C. H. No. 4. (Rt) | 73 | 18 months | Opium eater. | Prelim. Irid. and 5 weeks later extracted under ether. Cornea thin and flabby. Some soft cortex left in capsule. | Mild iritis on 10th day, lasting 3 weeks. On 20th day black opening through cortex. | Under observation 6 weeks | $\frac{1}{2}\frac{0}{0}\frac{0}{0}$ | Iridot'my | $\frac{1}{2}\frac{0}{0}\frac{0}{0}$ | 4 months later after excessive use of opium "became blind," "could only see light." |
| Mrs. Michael S. No. 5. (Rt) | 35 | 11 months | ..... | Prelim. Iridectomy and 24 days later extraction under ether. Lens hard and smooth. T-shaped capsulotomy. | Normal. | 18 days | $\frac{2}{1}\frac{0}{0}\frac{0}{0}$— | ..... | $\frac{2}{2}\frac{0}{0}$— | Her left eye had been lost by my indiscreet efforts with a suction apparatus, under a mistaken idea that the lens was soft |
| Mrs. James K. No. 6. (Rt) | 62 | 3 years | ..... | Prelim. Iridectomy and 4 weeks later extraction under ether. T-shaped capsulotomy. | Mild iritis. | 4 weeks | $\frac{2}{5}\frac{0}{0}$ | ..... | $\frac{2}{4}\frac{0}{0}$ | 13 yrs. later r. v. $\frac{2}{7}\frac{0}{0}$ |
| No. 7 (Left) | | 3 years | ..... | Prelim. Iridectomy and 5 weeks later extraction under ether. | Mild iritis. | 3 weeks | $\frac{2}{2}\frac{0}{0}\frac{0}{0}$ | Discission | $\frac{2}{7}\frac{0}{0}$ | By friend's report "sight persisted until his death, 8 yrs. later |
| Stephen S. No. 8. (Rt) | 73 | 18 months | ..... | Prelim. iridectomy and 3 weeks later extraction under ether. Violent vomiting after bandage was applied. Peripheral cut in both capsules. | Irido-capsulitis. | Under observation 3 months | Counts fingers at 2 ft | ..... | P. L. | Iridotomy declined. |

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|---|---|---|---|---|---|---|---|---|---|---|
| Michael B.<br>No. 9. (Left) | 56 | 15 years | ..... | W. Iridectomy, under ether. Peripheral cut in capsule. | Normal. | 3 weeks | $\frac{20}{100}$ | ..... | $\frac{20}{70}$ | Daughter says, "sight good up to his death," 11 yrs. later. |
| No. 10. (Rt) | | 5 years | ..... | W. Iridectomy, under ether. Vomited. | Cystoid cicat'x. Iris thro' nasal end of wound. | 20 days | $\frac{20}{200}$ | ..... | $\frac{20}{70}$ | Mother had cataract, and of 6 children, 3 had cataracts. |
| Mrs. Geo. L.<br>No. 11. (Left) | 42 | 6 years | ..... | W. Iridectomy, under ether. | Small prolapse of iris at nasal end of wound. Cystoid cicatrix. | 4 weeks | $\frac{20}{200}$ | ..... | $\frac{20}{200}$ | |
| Michael J.<br>No. 12. (Rt) | 55 | 6–8 mos | Translucent cortex | Without iridectomy, lens presenting in wound on finishing section. Under ether. | Patient entirely unmanageable. wound reopened. Prolapse of iris. Severe iritis. | On 24th day was discharged from case. Eye still red | Fingers at 1 ft | ..... | 3 years later R. V. $\frac{20}{40}$ | Met him by accident, and he came to office for test. |
| Mrs. Morris G.<br>No. 13. (Rt) | 69 | 2 years | ..... | W. Iridectomy, under ether. Small amt. cortex left behind. Peripheral cut in capsule. | Normal. | 19 days | $\frac{20}{200}$ | Discission | $\frac{20}{30}$ | Husband reports that sight persisted up to her death, 9 yrs. later. |
| Mrs. John C.<br>No. 14. (Left) | 43 | 4 years | ..... | W. iridectomy, under ether. Peripheral cut in capsule. | Normal. | 16 days | $\frac{20}{200}$ | ..... | $\frac{20}{100}+$ | Rt. extracted previously by another operator. R. V. $\frac{20}{100}$<br>3 yrs. later, L.v. $\frac{20}{100}+$ |
| No. 15. (Rt) | | 8 months | ..... | W. iridectomy, under ether. Iris cut during section. Small bead vitreous lost. | Iritis. | 26 days | $\frac{8}{200}$ | ..... | $\frac{20}{70}$ | 10 yrs. after her son-in-law reports "sight good." |
| Mrs. Thos. Y.<br>No. 16. (Left) | 60 | 7 months | ..... | W. iridectomy, under ether. Much manipulation to remove cortex. Cornea thin and flabby. | Irido-capsulitis. | Under observation 3 months | P. L. | ..... | P. L. | Iridotomy declined. |

| Name, Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| James C. No. 17. (Rt) | 60 | 2 years | ..... | With iridectomy, under cocaine. (Bpt. Hospital). Large section. Broad iridectomy. Peripheral capsulotomy, easy delivery of lens. | Normal. | 23 days | $\frac{2}{200}$ | ..... | $\frac{2}{100}$ | ..... |
| No. 18. (Rt) | | 10 years | Slightly defective field. | With iridectomy, under cocaine. Iris cut by knife. Lens fitted wound tightly. Cortex left behind. | Mild iritis. | 17 days | Not taken | Discission | $\frac{2}{70}+$ | 10 yrs. later, r. v. $\frac{2}{70}$ |
| Miss Mar-a K. W. | 63 | | | | | | | | | Both extracted at one sitting. |
| No. 19. (Left) | | 2 years | Some transparent cortex. | W. iridectomy, under cocaine. Iris cut by knife. Easy delivery. Smooth lens. | Mild iritis. | 17 days | Not taken | 2 Discissions. | $\frac{2}{70}+$ | 10 yrs. later, l.v. $\frac{2}{70}$ |
| Sarah A. H. No. 20. (Rt) | 70 | 4 years | Patient feeble. | W. iridectomy, under cocaine. Smooth operation. | Iritis. Gaping of inner corner of wound. Prolapse of iris thro' it. | 5 weeks | Fingers at 4 ft | ..... | $\frac{}{200}$ | Died about 2 months after, of senile gangrene. |
| Isaac C. B. No. 21. (Left) | 73 | ..... | ..... | W. iridectomy, cocaine. Smooth operation. | Normal. | 18 days | Not taken | Discission | $\frac{2}{70}+$ | "Vision persisted to his death, 6 yrs. later," Letter from his physician. |
| Mrs. W. F. D. No. 22. (Left) | 55 | 11 months. | Soft cortex. | Without iridectomy. Ether. | Irido-capsulitis. | 6 weeks | Not taken | Discission | $\frac{2}{70}$ | ..... |
| No. 23. (Rt) | | 2 years. | ..... | Without iridectomy. Cocaine. (Bpt. Hospital). | Iritis. | 26 days | $\frac{2}{70}$ | ..... | $\frac{2}{70}+$ | 9 yrs. later r.v. $\frac{2}{70}$ |
| Miss Johanna M. C. | 58 | | | | | | | | | |
| No. 24. (Left) | | 1 year | ..... | W. iridectomy. Cocaine. (Bpt. Hospital). | Normal. | 17 days | $\frac{2}{70}$ | ..... | $\frac{2}{70}+$ | 9 yrs. later l.v. $\frac{2}{70}$ |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 25. (Rt) | | 8 months | ..... | W. iridectomy. Cocaine. Iris cut w. knife. (Bpt. Hospital). Lens smooth. | Normal. | 19 days | $\frac{20}{100}$ | ..... | $\frac{20}{40}$ — | 8 yrs. later sight "very good." Both, 3 years between operations. |
| Mrs. Ann F. | 54 | | | | | | | | | |
| No. 26. (Left) | | 7 months | Soft cortex. | Without iridectomy. Cocaine. Soft cortex all removed, but w. considerable manipulation. | Normal. | 3 weeks | $\frac{20}{200}$ | ..... | $\frac{20}{200}$ | Secondary operation declined. |
| John B. M. No. 27. (Rt) | 60 | 3 years | ..... | W. iridectomy. Cocaine. Smooth operation. | Irido-capsulitis. | 26 days | Not taken | Discission | $\frac{20}{100}$ + | 3 months later relapse, irido-capsulitis uncontrolled. Sympathetic inflammation of the other eye. Total loss both eyes. |
| No. 28. (Rt) | | 18 years | Anterior layers of lens transparent. | W. iridectomy. Cocaine. (Bpt. Hosp). Iridectomy broad. Lens smooth. | Iritis. | 25 days | Not taken | ..... | $\frac{20}{40}$ + | 1 yr. between operations. |
| Chas. H. A. | 62 | | | | | | | | | |
| No. 29. (Left) | | 18 years | ..... | W. iridectomy. Cocaine. (Bpt Hospital). Small bead vitreous lost. | Normal. | 22 days | Not taken | ..... | $\frac{20}{70}$ | |
| No. 30. (Rt) | | 2 years | ..... | W. iridectomy. Cocaine. Vitreous presented in wound. Extraction w. spoon. (Bpt. Hospital). | Iritis. | 25 days | $\frac{8}{200}$ | ..... | $\frac{18}{200}$ | ..... |
| Patrick F. | 48 | | | | | | | | | |
| No. 31. (Left) | | 2 years | Lens dislocated, hanging in vitreous by infero nasal portion of zonule. | Without iridectomy. Cocaine. (Bpt. Hospital). Section upward. Extraction with tenaculum spoon. Lens in its capsule. | Normal. | 3 weeks | $\frac{18}{200}$ | ..... | $\frac{20}{200}$ | A yr. or more later this eye became totally blind. "could only see light." |
| No. 32. (Left) | | 3 years | An invalid. Has chronic conjunct., which was treated. | Without iridectomy. Ether. Extended lens himself with orbiculosis. Some vitreous lost. | Severe iritis. | 6 weeks | Fingers at 10 ft | ..... | $\frac{20}{200}$ | A few weeks before his death. 3 yrs. later, l. v. $\frac{10}{200}$ |
| Wm. W. | 65 | | | | | | | | | |
| No. 33. (Rt) | | 10 years | 2 weeks before each operation rt. lens in ant. chamber. | Section upwards. Extraction from ant. chamber w. spoon. Cocaine. | Normal. | 23 days | $\frac{20}{200}$ | ..... | $\frac{20}{100}$ | A few weeks before his death, 3 yrs. later, r. v. $\frac{20}{200}$ |

| Name, Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|
| Burr O.<br>No. 34. (Rt) | 75 | 3 years | ..... | W. iridectomy. Cocaine. (Bpt. Hosp). Cornea thin and flabby. Iridectomy broad. Easy extraction. No soft cortex. Collapse of corn'a 20 min. before ant. chamb'r filled. | Patient unmanageable with mania a part of the time. Severe iritis. | Under observation, 4 months | $\frac{1\ 0}{2\ 0\ 0}$ | ..... | $\frac{1\ 0}{2\ 0\ 0}$ | One year later "pulled up" pupil. Rt. good. P. L. Died about 2 yrs. later. |
| No. 35. (Left) | 65 | 8 years | ..... | Without iridectomy. Cocaine. Extracted lens in its capsule. Slight loss of vitreous. | Normal. | 17 days | $\frac{2\ 0}{4\ 0}$ | ..... | $\frac{2\ 0}{4\ 0}$ | 2 yrs. later l.v. $\frac{2\ 0}{7\ 0}$ |
| Harvey S. W. | | | | | | | | | | Zonule weak in both these eyes. Lens almost presenting immediately after sections. No attempt at capsulotomy or iridectomy in either. |
| No. 36. (Rt) | | 2 years | ..... | Without iridectomy. Cocaine. Extracted lens in its capsule. Small bead vitreous lost just after section. Extraction with fenestrated scoop. | Normal. | 20 days | $\frac{2\ 0}{7\ 0}$ | ..... | $\frac{2\ 0}{4\ 0}$ | |
| No. 37. (Rt) | 49 | 1 year | Soft cortex. | W. iridectomy. Cocaine. Peripheral cut in capsule. | Normal. | 14 days | $\frac{2\ 0}{1\ 0\ 0}$ | ..... | $\frac{2\ 0}{7\ 0}$ | ..... |
| William W.<br>No. 38. (Left) | | 2 years | ..... | W. iridectomy. Cocaine. Peripheral cut in capsule. | Normal. | 16 days | $\frac{2\ 0}{7\ 0}$ | ..... | $\frac{2\ 0}{5\ 0}$ | ..... |
| No. 39. (Left) | 63 | 3 years | ..... | Without iridectomy. Cocaine. Smooth operation. | Mild iritis. | 18 days | $\frac{2\ 0}{7\ 0}$ | ..... | $\frac{2\ 0}{5\ 0}$ | 1 yr. later l.v. $\frac{2\ 0}{2\ 0\ 0}$ |
| Mrs. Catherine S. B.<br>No. 40. (Rt) | | 3 years | ..... | W. iridectomy. Cocaine. Section too small, enlarged with Graefe knife. Small amount of vitreous lost. | Irido-capsulitis. | Under observation 2 months | Fingers at 1 ft. | ..... | ..... | Rt. globe enucleated. |
| John B.<br>No. 41. (Left) | 48 | ..... | Opacity cornea. | Without iridectomy. Cocaine. Some cortex left behind. Small bead vitreous lost. | Normal. | 19 days | $\frac{2\ 0}{2\ 0\ 0}$ | ..... | $\frac{2\ 0}{2\ 0\ 0}$ | Media clear behind opacity of cornea. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| James E. F.<br>No. 42. (Rt) | 62 | 19 years<br>Under observation 9 years | Myopia. Translucent cortex. | Without iridectomy. Cocaine. Lens in capsule presented in wound and was extracted without capsulotomy. | Normal. | 23 days | $\frac{20}{200}$ | ..... | $\frac{20}{100}$ | 2 yrs. later partial detach. retina R. V. $\frac{8}{200}$ |
| Jessie M. F.<br>No. 43. (Left) | 81 | 3 years | ..... | W. iridectomy. Cocaine. Cornea thin and flabby. Collapsed after section. Central cut in capsule. Lens smooth. Ant. chamber full of blood. | Iritis. | 21 days | $\frac{20}{100}$ | ..... | $\frac{20}{100}$ | Sight persisted until death, 7 years later. |
| No. 44. (Left) | | 12 years | Soft cortex. | W. iridectomy. Cocaine. Small piece cortex left behind. Ceutral cut in capsule. | Normal. | 15 days | $\frac{20}{50}$ — | ..... | $\frac{20}{30}$ — | 6 yrs. later l. v. $\frac{20}{30}$ — |
| Susan A. H. | 56 | | | | | | | | | 3 yrs. between operations. |
| No. 45. (Rt) | | 10 years | ..... | W. iridectomy. Cocaine. Smooth operation. Central cut in capsule. | Mild iritis. | 16 days | $\frac{20}{40}$ — | ..... | $\frac{20}{30}$ + | 3 yrs. later r.v. $\frac{20}{30}$ |
| Mr. J. L.<br>No. 46. (Left) | 69 | 7 years | Slightly defective field. | Without iridectomy. Cocaine. Zonule weak. Lens extracted in capsule. Slight loss of vitreous | Iritis. | 4 weeks | Not taken | ..... | $\frac{20}{100}$ | Vision persisted to his death, 5 years later. |
| Mrs. Isaac N. M.<br>No. 47. (Left) | 51 | 6 years | Soft cortex. | W. iridectomy. Cocaine. Extraction of lens in capsule w. spoon. Slight loss of vitreous. | Mild iritis. | 22 days | $\frac{20}{70}$ + | ..... | $\frac{20}{70}$ + | 6 yrs. later r.v. $\frac{20}{30}$ |
| Mrs. Harriet E. S.<br>No. 48. (Left) | 74 | 7 years | Invalid. Emaciated. Only able to sit up part of the day. Soft cortex. | Preliminary iridectomy, and 4 weeks later extraction. Cocaine. Fixation forceps fore conjunctiva. Capsule tough and opaque. Some cortex left behind | Irido-capsulitis. | 5 weeks | P. L. | Iridotomy | $\frac{1}{200}$ | She retained this vision until her death, 4 years later. |
| No. 49. (Rt) | | 4 years | ..... | Without iridectomy. Cocaine. Lens in its capsule. Slight loss of vitreous. (Bpt. Hospital). | Normal. | 22 days | Not taken | ..... | $\frac{20}{40}$ + | Both operations done at one sitting. |
| Mrs. Mary S. | 71 | | | | | | | | | |
| No. 50. (Left) | | 2 years | ..... | W. iridectomy. Cocaine. Free laceration central portion capsule. (Bpt. Hospital). | Mild iritis. | 22 days | Not taken | ..... | $\frac{20}{50}$ — | |

| Name, Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| Mrs. Alden W. No. 51. (Rt) | 66 | 3 years | ..... | Without iridectomy. Cocaine. No tendency to prolapse. | Normal. | 19 days | $\frac{20}{100}$ | Discission | $\frac{20}{70}$ | 5 yrs. later r.v. $\frac{20}{70}$ |
| No. 52. (Left) | | ..... | Lens dislocated partly into ant. chamber. Opacity cornea. | Without iridectomy. Section downward. Delivery w. fenestrated scoop. (Bpt. Hospital). Cocaine. | Iritis. | 20 days | $\frac{10}{200}$ | ..... | $\frac{10}{200}$ | Operations 10 months apart. Both lenses invitreous for years. Also has daughter, age 23, with both lenses invitreous. 7 years later she writes, sight "as good as ever." |
| Mrs. Bernard L. No. 53. (Rt) | 40 | ..... | Lens dislocated partly into ant. chamber. | Without iridectomy. Section upward. Delivery w. fenestrated scoop. (Bpt. Hospital). Cocaine. | Normal. | 18 days | $\frac{20}{100}$ | ..... | $\frac{20}{40}$ — | |
| Cornelius B. No. 54. (Rt) | 79 | 1 year | ..... | Without iridectomy. Cocaine. Lens in capsule. Extracted with fenestrated scoop. Vitreous presented in wound. (Bpt. Hospital). | Normal. | 19 days | $\frac{20}{200}$ | ..... | $\frac{20}{70}$ — | Died 6 months later. "sight good." |
| Alden G. R. No. 55. (Rt) | 52 | 8 months | ..... | W. iridectomy. Cocaine. Smooth. Amber colored lens. | Normal. | 17 days | Not taken | ..... | $\frac{20}{50}$ | ..... |
| Wm. H. B. No. 56. (Rt) | 63 | 6 years | Soft cortex. | Without iridectomy. Cocaine. Shallow ant. chamber. Easy delivery. No cortex left behind. (Bpt. Hospital). | Iritis. | 4 weeks | $\frac{20}{100}$ | ..... | $\frac{20}{50}$ — | His left lens had been extracted by another operator, and after discission, l. v. $\frac{20}{50}$ |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| No. 57. (Left) | | 1 year | ..... | Without iridectomy. Cocaine. Soft cortex left behind. Peripheral capsulotomy. (Bpt. Hospital). | Patient unmanageable. Dresssings never in place over four hours. Healing normal. One posterior synechia. | 22 days | $\frac{20}{200}$ | Discission | $\frac{20}{40}$ — | 5 months later glaucoma, fulminans. Iridectomy in 24 hrs., relief from pain, but no return of vision. |
| Patrick B. No. 58. (Rt) | 51 | 18 months | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. No soft cortex. (Bpt. Hospital). | Patient more manageable. Healing normal. | 21 days | Not taken | ..... | $\frac{20}{30}$ | Has retained this vision to date. (4 years). |
| Michael C. No. 59. (Left) | 75 | ..... | Bad general condition. | W. iridectomy. Cocaine. Peripheral capsulotomy. Capsule tough. Lens slightly dislocated upward, lower edge came first. Cornea collapsed for ten minutes after extraction. Considerable cortex left behind. (Bpt. Hospital). | Iritis and much rolling in of lower lid. | 24 days | Not taken | Discission | $\frac{1}{200}$ | 2 years later extracted his other lens (Rt.) and he died of apoplexy 4 days after operation. |
| No. 60. (Rt) | | 18 months | ..... ..... | W. iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Mild iritis. | 22 days | $\frac{20}{100}$ | ..... | $\frac{20}{30}$ + | |
| Alexander M. No. 61. (Left) | 55 | 18 months | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Mild iritis. | 19 days | $\frac{20}{100}$ | Discission | $\frac{20}{30}$ — | 6 months between the operations. |
| Mrs. W. W. N. No. 62. (Rt) | 69 | 4 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. | Normal. | 15 days | $\frac{20}{200}$ | ..... | $\frac{20}{20}$ — | 5 yrs. later r.y. $\frac{20}{20}$ — |
| Joseph S. No. 63. (Rt) | 65 | ..... | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Iris caught in wound, but easily replaced by manipulation with lid. (Bpt. Hospital). | Mild iritis. | 22 days | $\frac{20}{70}$ + | Discission | $\frac{20}{40}$ + | ..... |

| Name, Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| Andrew W. No. 64. (Left) | 54 | 9 months | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Some cortex left behind. (Bpt. Hospital). | Mild iritis. Some cortex in pupil. Pupil easily dilated. | 2 months | $\frac{20}{200}$ | ..... | 0 | On 12th day while drunk received a forcible blow over l. e., wound reopened its whole length, vitreous extruded. |
| Mrs. A. B. A. No. 65. (Rt) | 71 | 10 years | Soft cortex. | Without iridectomy. Cocaine. Central capsulotomy. Some cortex left behind. | Normal. | 15 days | Not taken | ..... | $\frac{8}{200}$ | After operation discovered old choroiditis scar central, involving macula. Media clear. |
| Mrs. Chas. B. No. 66. (Left) | 68 | 12 years | Defective field. | Without iridectomy. Cocaine. Central capsulotomy. Fibres of iris stretched so that pupil was irregular. (Bpt. Hospital). | Normal. | 12 days | $\frac{20}{200}$ | ..... | $\frac{20}{100}$ | Discission advised. |
| Samuel D. No. 67. (Left) | 53 | ..... | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 17 days | $\frac{20}{200}$ | ..... | $\frac{20}{50}$ | 2½ yrs. later sight "good." |
| Geo. A. H. No. 68. (Rt) | 74 | 3 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 15 days | $\frac{20}{200}+$ | Discission | $\frac{20}{20}-$ | 2 yrs. after r.v. $\frac{20}{30}$ |
| F. T. L. No. 69. (Rt) | 74 | ..... | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Muco-purulent conjunctivitis. | 22 days | $\frac{20}{200}$ | ..... | $\frac{20}{100}+$ | ..... |

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|---|---|---|---|---|---|---|---|---|---|---|
| Jane E. M. No. 70. (Rt) | 71 | 2 years | ..... | Without iridectomy. Cocaine. Central capsulotomy. Considerable soft cortex. | Normal. | 16 days | $\frac{20}{70}$ | ..... | $\frac{20}{70}$ | 4 yrs. later discission and r. v. $\frac{20}{40}+$ |
| Mrs. Chauncy R. No. 71. (Left) | 75 | 6 years | Soft cortex. | Without iridectomy. Cocaine. Cornea collapsed. Nearly an hour before ant. chamber reformed. Iris wounded with knife. (Bpt. Hospital). | Prolapse iris. | 33 days | $\frac{1\,6}{200}$ | ..... | $\frac{20}{200}$ | 3½ yrs. later a relative reports "perception of light only." |
| Mrs. Thos. B. No. 72. (Left) | 67 | ..... | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Considerable soft cortex left behind. Small bead of vitreous lost. (Bpt. Hospital). | Mild iritis. | 24 days | $\frac{20}{100}$ | ..... | $\frac{20}{70}$ | 2½ yrs. later sight, "no change noticed." |
| Mrs. B. M. B. No. 73. (Left) | 51 | 4 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Prolapse iris on 3d day from a blow. | Under observation 3 months | $\frac{10}{200}$ | ..... | $\frac{20}{50}-$ | Region of wound smooth in two months. No ciliary injection at any time. 3 yrs. later, l. v. $\frac{20}{50}$ |
| Wm. H. G. No. 74. (Left) | 42 | 2 years | Probably traumatic from blow 2 years before. | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 15 days | Not taken | ..... | $\frac{20}{100}+$ | ..... |
| No. 75. (Rt) | 69 | 7 years | ..... | With iridectomy. Cocaine. Central capsulotomy. (Bpt. Hospital). | Normal. | 13 days | Not taken | ..... | $\frac{20}{100}$ | 2½ years later she writes that her vision is "very good." Can read, sew, etc." |
| Catherine A. H. No. 76. (Left) | | 3 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. | On 3d day ant. chamber full of blood. Absorbed in 36 hours | 13 days | Not taken | ..... | $\frac{20}{100}$ | |

| Name, Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| Mr. A. S. H. No. 77. (Left) | 64 | ..... | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Incarceration of iris. | 17 days | Not taken | ..... | $\frac{2}{7}\frac{0}{0}$ | Pupil displaced upward. 3 yrs. later his vision went down to $\frac{2}{2}\frac{0}{0}\frac{0}{0}$ but after discission came up to $\frac{2}{4}\frac{0}{0}$ — 2 months after this discission, during an attack of "grip," iridocapsulitis, with hypopyon. Recovery in two weeks, l. v. $\frac{2}{4}\frac{0}{0}$ — again. |
| Mrs. Elizabeth W. No. 78. (Rt) | 65 | 3 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 13 days | Not taken | ..... | $\frac{2}{3}\frac{0}{0}$ — | ..... |
| James B. No. 79. (Rt) | 68 | 10 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 19 days | $\frac{2}{1}\frac{0}{0}\frac{0}{0}$ | ..... | $\frac{2}{4}\frac{0}{0}$ — | 18 months later diminution of vision, which after discission came up to $\frac{2}{3}\frac{0}{0}$ — |
| Joseph T. F. No. 80. (Rt) | 73 | 2½ years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 23 days | $\frac{2}{2}\frac{0}{0}\frac{0}{0}$ + | Discission | $\frac{2}{5}\frac{0}{0}$ — | 20 months later. "no change in sight." |
| Hugh J. M. No. 81. (Rt) | 64 | 1 year | ..... | W. iridectomy. Cocaine. Peripheral capsulotomy. Iris wounded with knife. | Iritis. | 25 days | $\frac{1}{2}\frac{0}{0}\frac{0}{0}$ | Discission | $\frac{2}{5}\frac{0}{0}$ — | Died of apoplexy 6 months later. |

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|---|---|---|---|---|---|---|---|---|---|---|
| Jesse M. No. 82. (Rt) | 63 | 2 months | Lens disk cated. Zonule ruptured, except nasal portion. Lens swings back and forth in the vitreous. | Without iridectomy. Cocaine. Lens extracted w. fenestrated scoop. Considerable vitreous lost. Cornea collapsed and folded into the vitreous for two hours, but at last good apposition. (Bpt. Hospital). | Normal. | 24 days | $\frac{20}{200}$ | ..... | $\frac{20}{50}$ — | ..... |
| Mrs. Mary J. O. No. 83. (Left) | 63 | 6 months | ..... | Without iridectomy. Cocaine. Section small. Unusual amount of manipulation. Small bead of vitreous lost. (Bpt. Hospital). | Suppuration. Panopthalmitis. Phthisis Bulbi. | ..... | 0 | ..... | 0 | To save further loss of vitreous eye was closed without cleansing conjunctival sac, and without making sure that lips of wound were in good apposition. |
| Mrs. Mary R. No. 84. (Rt) | 57 | 2 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Soft cortex left behind. Tendency of iris to prolapse. (Bpt. Hospital). | Prolapse of iris on 5th day. | Under observation 2 months | $\frac{20}{200}$ | ..... | $\frac{20}{200}$ | Discission declined. |
| Mrs. Maria H. R. No 85. (Rt) | 46 | 3 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 15 days | Not taken | ..... | $\frac{20}{20}$ — | 18 months later r. v. $\frac{20}{200}$ After discission r. v. $\frac{20}{30}$ + glaucoma fulminans followed discission. Section for iridectomy. Escape of vitreous. 3 weeks later r. v. $\frac{20}{30}$ |
| Mrs. Ann L. W. No 86. (Rt) | 60 | 6 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt Hospital). | Normal. | 17 days | Not taken | ..... | $\frac{20}{40}$ | 18 months later r. v. $\frac{20}{40}$ |

| Name, Eye and Number. | Age | Probable duration of Cataract. | Complications. | Operation. | Healing Process. | Duration of Treatment. | Primary Vision. | Secondary Operation. | Later Vision. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|
| Mrs. W. G. S. No. 87. (Left) | 79 | 1 year | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Mild iritis. | 22 days | $\frac{20}{70}$ | 2 Discissions. | $\frac{20}{30}$ | 18 months later l. v. $\frac{20}{30}$ |
| James C. No. 88. (Rt) | 62 | 20 years | Traumatic. Piece steel removed from lens 2 yrs. ago. Lens now in anter. chamber. | Without iridectomy. Cocaine. Lens extracted with scoop. (Bpt. Hospital). | Iritis. | 25 days | Not taken | ..... | $\frac{10}{200}$ | |
| Zopher B. No. 89. (Left) | 74 | 7 years | ..... ..... | W. iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 19 days | $\frac{20}{100}+$ | ..... | $\frac{20}{15}-$ | ..... |
| John F. No. 90. (Left) | 53 | 3 years | . . | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 20 days | $\frac{20}{70}$ | Discission | $\frac{20}{20}-$ | 1 yr. later r. v. $\frac{20}{20}-$ |
| No. 91. (Rt) | | 6 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Cornea thin and flabby. Collapsed for six hours after extraction. Then prolapse iris and iridectomy. Ant. chamber filled w. blood. (Bpt. Hospital). | Iritis. | Under observation 3 months | $\frac{3}{200}$ | 2 Discissions. | $\frac{20}{200}$ | |
| Mrs. Henriett G. No. 92. (Left) | 74 | 2 years | ..... ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Cornea collapsed for six hours after extraction. (Bpt. Hosp'l). | Iritis. | Under observation 3 months | $\frac{3}{200}$ | Discission | $\frac{8}{200}$ | 7 months later vision "the same." Both. |
| Mrs. David M. F. No. 93. (Left) | 68 | 18 months | ..... | Without iridectomy. Cocaine. Central capsulotomy. Much manipulation. Tendency to prolapse. (Bpt. Hospital) | Prolapse of iris on 2d day. Little irritation from it. Abscission in fourth week | Under observation 3 months | $\frac{20}{100}+$ | Discission | $\frac{20}{20}-$ | ..... |

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|---|---|---|---|---|---|---|---|---|---|---|
| Mrs. Mary B. R. No. 94. (Rt) | 52 | 6 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. | Normal. | 20 days | $\frac{20}{30}$ | ..... | $\frac{20}{30}-$ | ..... |
| Cornelius A. No. 95. (Left) | 64 | ..... | Periphery of lens translucent. | With iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 23 days | $\frac{20}{100}+$ | ..... | $\frac{20}{20}-$ | ..... |
| Wm. W. No. 96. (Rt) | 53 | 1 year | ..... | With iridectomy. Cocaine. Peripheral capsulotomy. Small bead vitreous lost. Extraction with fenestrated scoop. (Bpt. Hospital). | Iritis. | 22 days | $\frac{10}{200}$. | Discission | $\frac{20}{100}+$ | 4th day after discission infection of ant. chamber. Hypopyon, but pus all absorbed, leaving discission wound open and r. v. $\frac{20}{100}+$ |
| Katrina W. No. 97. (Rt) | 66 | 18 months | ..... | With iridectomy. Cocaine. Peripheral capsulotomy. Considerable manipulation. Some cortex left behind. (Bpt. Hospital). | Irido-capsulitis. Shred of capsule in wound and projecting through at nasal end. | 27 days | Not taken | ..... | $\frac{20}{40}$ | 6 months later r. v. $\frac{20}{30}-$ |
| Mrs. Elizabeth D. No. 98. (Rt) | 52 | 1 year | ..... | With iridectomy. Cocaine. Peripheral capsulotomy. Iris wounded w. knife. (Bpt. Hospital). | On 8th day hemorrhage into ant. chamber. Blood absorbed in 4 days. | 29 days | Not taken | Discission | $\frac{20}{50}-$ | ..... |
| Mrs. Jane L. L. No. 99. (Rt) | 65 | 5 years | ..... | Without iridectomy. Cocaine. Peripheral capsulotomy. Smooth operation. (Bpt. Hospital). | Normal. | 17 days | Not taken | ..... | $\frac{20}{30}$ | ..... |
| Mrs. Geo. H. No. 100. (Left) | 74 | 5 years | ..... | With iridectomy. Cocaine. Peripheral capsulotomy. Fixation forceps tore conjunctiva below. Ecchymosis of whole lower half ocular conjunctiva. | Normal. | 18 days | Not taken | ..... | $\frac{20}{30}$ | ..... |

Lastly, I beg leave to present to the Society a table of the first hundred cases of senile cataract operated upon by me in Bridgeport and vicinity. During this same period there were thirteen out of town cases with which I had more or less to do, sometimes as operator and sometimes not, which are not included; among the thirteen was one total failure, and one pulled up pupil with good light perception.

During the same period also another series of operations was done at the Manhattan Eye and Ear Hospital in which the percentage of failure is a little less than in this series. *Ether* was used as an anesthetic in eighteen cases, *Cocaine* in eighty-two. *Preliminary Iridectomy* was done in nine. *Iridectomy at time of operation*, thirty-eight. No Iridectomy, fifty-three.

Among the fifty-three cases *without* Iridectomy were five, in which prolapse of the iris occurred.

Among the thirty-eight cases *with* Iridectomy were three in which prolapse of the iris occurred, and one in which prolapse of capsule occurred.

I find in my notes but one case of Incarceration of iris, I am sure there must have been more which were not recorded. The visual results were as follows:

$\frac{20}{15}$ 1; $\frac{20}{20}$ to $\frac{20}{30}$ 12; $\frac{20}{30}$ to $\frac{20}{40}$ 14;—$\frac{20}{40}$ to $\frac{20}{50}$ 12;—$\frac{20}{50}$ to $\frac{20}{70}$ 23;—$\frac{20}{70}$ to $\frac{20}{100}$ 15;—$\frac{20}{100}$ to $\frac{20}{200}$ 8;—$\frac{20}{200}$ to $\frac{10}{200}$ 7;—$\frac{8}{200}$ 1;—P. L. 2; O, 3.

Of the three eyes that were entirely lost; One (83) was lost through suppurative panophthalmitis. A second (40) was lost by a milder form of suppurative inflammation, which seemed to begin in the capsule. The third (64) was lost by mechanical violence. On the twelfth day, he got drunk and received a blow which reopened the wound and extruded nearly all the vitreous.

The two cases with perception of light (8 and 16) must be counted as failures, for though a secondary operation was advised, it was not permitted. I have already alluded to the fact that the operation of couching was given up, not because the operation itself was not successful, but because the subsequent history of the cases was not satsifactory. At considerable expenditure of time and trouble I have succeeded in following

up seventy of the one hundred cases, reported to-day, most of them for more than a year after the operation. There were nine eyes in which within three and a half years after the original operation serious changes took place.

*Case* 27. Healthy man, age sixty, had extraction with iridectomy, Irido capsulitis after this extraction, probably of bacterial origin. Eye quiet in twenty-six days with opaque capsule about a month later. Discission of capsule which brought the vision up to $\frac{20}{100}$. Three months later relapse of Irido capsulitis destroying sight of not only the eye operated upon, but the other also by sympathetic inflammation.

*Case* 4. Woman, age seventy-three, opium eater. Preliminary Iridectomy and five weeks later extraction. Considerable soft cortex left in the capsule. After six weeks I unwisely allowed her to go to her home, twenty miles distant. At that time the eye was quiet, pupil dilated, soft cortex more than half absorbed, and vision $\frac{10}{200}$. About a month later she had partially pulled up pupil, and vision P. L. An Iridotomy brought this back to $\frac{10}{200}$. But four months later sight was down to P. L. again.

*Case* 57. Man, age fifty-one, extraction without irideetomy, discharged from hospital in twenty-two days with $\frac{20}{200}$ vision, one posterior synechia, later discission of capsule raising vision to $\frac{20}{40}$ —, went back to his home, as gate-tender at a railroad crossing, and five months later had glaucoma fulminans in this eye, and although an iridectomy was done in twenty-four hours, the sight was not restored. His other eye is case 58 of our series and has a vision of $\frac{20}{30}$, which it has retained for four years.

*Case* 34. One year after extraction had failed from $\frac{10}{200}$ down to P. L.

*Case* 31. One year after extraction had failed from $\frac{20}{200}$ down to P. L.

*Case* 71. Three and a half years after extraction had failed from $\frac{20}{200}$ down to P. L.

The causes of the diminution of sight in these three cases are not known.

*Case* 85. Woman, age forty-six, extraction without iridec-

tomy, unusually quiet convalescence. Left hospital in fifteen days. Two weeks later her vision was $\frac{20}{20}$.— Eighteen months later her vision had gone down to $\frac{20}{200}$. A discission of capsule was done, bringing her vision back to $\frac{20}{30}$+. Eleven days after the discission, she had glaucoma fulminans in that eye, reducing vision in eight hours from $\frac{20}{30}$+ to counting figures at two feet. A section for iridectomy was made, vitreous presented in the wound, and perhaps three minims were evacuated. The iris was left intact. The operation relieved pain and restored vision to $\frac{20}{30}$ three weeks later.

*Case* 77. Man, age sixty-four, operation without iridectomy, incarceration of iris. Left the hospital in seventeen days. Four weeks later his vision was $\frac{20}{70}$. Three years later his vision had gone down to $\frac{20}{200}$ but after discission of capsule came up to $\frac{20}{40}$—. Two months after the discission during an attack of grip, he had an attack of irido capsulitis with hypopyon, but recovered after two weeks in the hospital with $\frac{20}{40}$— vision again.

*Case* 96. Man, age fifty-three, extraction with iridectomy, small bead of vitreous lost. In the hospital twenty-two days, primary vision $\frac{10}{200}$ three months later, discission of capsule. Four days later a grey thread-like line led from the wound downward and backward into the aqueous; the edges of the corneal wound were *not* infiltrated. The next day the aqueous was turbid, the edges of the capsular wound were covered with greyish furry looking material, and there was a small pool of pus in the lower part of the anterior chamber. On the next day the anterior chamber one third full of pus, and capsular wound entirely closed with the greyish material. From this time on the process gradually receded. In a week the pus was gone from the anterior chamber. In three weeks the capsular wound was open again at one end, and in two months there was no trace of the process left, the patient's vision being $\frac{20}{100}$+.

The only treatment was syrup of hydriodic acid internally, with atropine enough in the eye to keep the pupil dilated, and this was easily done as the iritis which accompanied the process was very mild.

From a purely bacteriological point of view this is the most interesting case of our series. Here was undoubted inoculation

of the anterior chamber with *something*, presumably bacteria beginning at the wound and gradually infecting the whole chamber. The capsule was most affected by the process. The corneal wound healed kindly and the iritis was mild.

Inoculation of the anterior chamber in animals is usually followed by destruction of the eye, but here is one case in a human eye in which it did not follow, even though the process was severe enough to temporarily close the capsular wound and to produce a hypopyon filling one third of the anterior chamber.

# THE ERRORS OF REFRACTION FOUND IN FOUR THOUSAND EYES.

BY H. S. MILES, M.D., BRIDGEPORT.

I am able to present to you to-day facts and conclusions based on a large number of cases; most of them are from the records of Dr. F. M. Wilson, with whom I am associated and who kindly put his history cards at my disposal for this purpose. Nearly one-half the cases that come to us are purely refraction, and as each patient is examined an average of two and a tenth times, it becomes a very important part of our work. Some of the cases are from those that I have myself examined at the Manhattan Eye and Ear Hospital, New York. I expected to collect even more than four thousand, but found that so much time had been consumed with these that I was unable to tabulate others before this meeting, although I had examined only to M in the cards. Only cases were taken where no disease had been recorded that could affect the vision; if the patients had beginning cataract, opacities of cornea, or any pathological changes in the media or fundus, they were rejected, nor does this list include presbyopes, unless they had an additional defect.

The details of the cases required nearly a hundred pages of foolscap. Besides what I am about to give you I noted the exact vision without glasses and without a mydriatic, then with glasses and without a mydriatic, and where atropine or hyoscyamine had been used, the vision with these without glasses and again with, the correcting glasses were recorded and the glasses prescribed, also if changes were made later, the duration of symptoms and the results of treatment when possible.

The following are our summaries: We find that seventy-six per cent., or three thousand and forty-five eyes, were hyperopic or far-sighted. It was proven by Dr. E. T. Ely, in 1879, that the majority of newly-born children are hyperopic. Seventy-two per cent. of the babies that he examined were, and probably most of us remain more or less so through life; it is surely true that people who have symptoms do. There are among this list seven hundred and eighty-seven myopic eyes, about twenty per

cent., and one hundred and six of mixed astigmatism, eyes hyperopic in one meridian and myopic in another, generally due to uneven curvature in the cornea. In sixteen cases one eye was far-sighted and the other near-sighted. There were sixty-two patients with one eye having an error, and none found in the other eye. Of the three thousand and forty-five far-sighted eyes two thousand three hundred and eighty-four were simply hyperopic with no astigmatism, four hundred and forty-two had hyperopic astigmatism, while two hundred and nineteen had hyperopia added to hyperopic astigmatism.

Of the seven hundred and eighty-seven near-sighted eyes four hundred and fifty-four were simple myopia, one hundred and eighty-two myopic astigmatism, and one hundred and fifty-one compound myopic astigmatism. There were three hundred and forty-one cases with presbyopia added to their error.

Concerning the vision: It was markedly different in the two eyes in three hundred and thirty-seven cases, and a slight difference occurred in four hundred and eight, while it was equal in one thousand two hundred and fifty-five, or sixty-three per cent; where a great difference is present the patient is often not aware of the fact, especially if one eye is normal or nearly so. In over one-quarter of the cases the vision was normal or better in both eyes, still three hundred and twelve of these five hundred and eighteen needed glasses.

The whole number of patients given glasses was one thousand three hundred and three, sixty-five per cent., leaving thirty-five per cent. that did not receive them, either because it was not thought advisable or because they already had their error corrected, or perhaps they did not return for their final examination. When we consider that in one thousand four hundred and eighty-two cases there was some fault in the acuity of vision, and that many of the remainder probably came expecting glasses, I think you will agree with me that sixty-five per cent. is conservative treatment.

Of the three hundred and forty-one cases of presbyopia one hundred and thirteen were fitted for distant as well as near vision. In nineteen cases where glasses were prescribed a plane glass was put in front of one eye, either because that eye was without error or because the vision could not be made good enough for both eyes to work together. Prisms were combined

with correcting lenses in fifteen cases. The accommodation was temporarily paralyzed by atropine or hyoscyamine in two hundred and eighty, or fourteen per cent.

As with other bodily ills, we find here that the number of women and girls affected far exceeds the men and boys. In our list are one thousand three hundred and fifty-one females, sixty-seven and one-half per cent., and six hundred and forty-nine males; seven hundred and sixty-eight of the women were single and five hundred and eighty-three married.

Regarding age we find the following; The youngest was two years, the oldest eighty. There were seventy-one under ten years, three hundred and ninety-five between ten and twenty, five hundred and twenty-eight between twenty and thirty, three hundred and sixty-nine between thirty and forty, three hundred and fifty between forty and fifty, one hundred and eighty-two between fifty and sixty, and but eighty-four over sixty. There were twenty-three cases without age recorded. From this we see that the period during which people have the most trouble with their eyes, or at least attend to them, is that between twenty and thirty, for we have five hundred and twenty-eight cases; from ten to twenty next to the greatest number, though there is little difference between second, fourth and fifth decades.

The symptoms complained of are numerous and varied, though at first patients usually say they cannot see well, or their eyes ache, or they have headaches. Very many say their "eyes are weak!" "Weak eyes" includes so much that we always ask them what they mean, and they will explain by telling us that their eyes pain or get tired easily; they smart, they burn, run water and blur; some come simply because their eyes are red, and count this the chief trouble; many complain that light hurts them; a few see sparks, flashes of light, and balls of fire; some see what they call specks or spots before their eyes. The less common symptoms include itching, blinking and twitching of lids. Five came because of dizziness, three complained of nausea, two had car sickness, one vomiting, three had had epileptic fits; but aside from the fact of not seeing well, the vast majority complain of pain on use, or eyeache or headache.

Many things have to be considered in getting the proper relation between symptoms and the giving of glasses. It is surprising to observe how little trouble some patients have with

errors of high degree, and on the other hand how a very little hyperopic astigmatism, for instance, will cause the patient the greatest misery. So it often becomes a nice point to decide when to give and when not to. We have to judge by the amount of trouble and its duration, the occupation of patient and the general health, as well as what we learn from our examination, and, least of all, what many people put first, the age.

There were among our cases eighty-six squints, of which seventy-one were convergent and fifteen divergent; thirteen of them were cured by glasses without an operation, fourteen were given glasses without an operation and the result not recorded, one was given glasses which did not correct, but the patient disappeared before an operation was performed, thirty-nine were straightened by an operation but given glasses in addition, eleven were operated upon and the result not recorded, three were operated upon with partial success, five were not treated either by operation or glasses. There were fifty-five squinting girls and twenty-three boys, showing that the muscles of females are weaker or that parents look after them more, or both. Thirty-six cases had decided insufficiencies of their muscles, though not amounting to squints. There were recorded a mild conjunctivitis in eighty-six cases, thirty-five had blepharitis, seventeen chalazia, ten styes.

These cases were an interesting study to me, covering, as they do, a period of sixteen years. Many things can be learned from examinations repeated after a lapse of considerable time; we can see how myopia progresses and how astigmatism sometimes changes; we watch presbyopia come on; we see how prisms relieve symptoms after lenses alone have failed, and many other interesting facts. Among the things that struck me forcibly while getting together these statistics was that so many, over twenty-five per cent., had normal vision in both eyes for distance; of these thirty-nine were presbyopic and complained of blurring with near work, leaving four hundred and seventy-nine most all with perfect sight for near and far, yet consulting us because of headaches of various kinds, (frontal, supraorbital, through temples, occipital or general), or they had aches or pains in their eyes, and three hundred and twelve of these needed glasses for relief.

Dissertation before the Fairfield County Association, Oct. 9, '94.

# THE PUPIL UNDER PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS.

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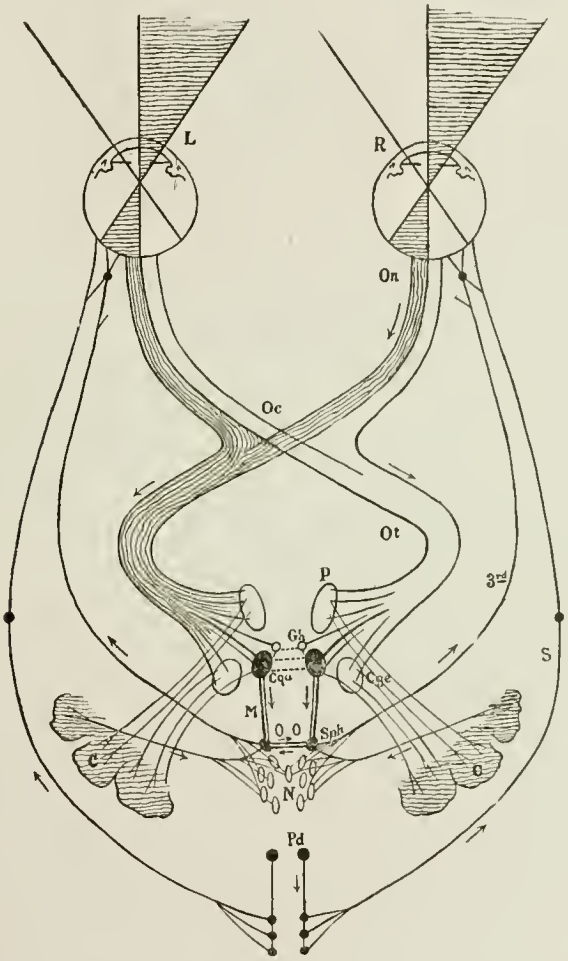
The eye is unique. Nowhere else in the body is there a living nerve exposed to view. Nowhere else can arteries and veins be watched without either skin or mucous membrane covering them. In no department of medicine do we need our mathematical knowledge, but errors of refraction must be corrected with exactness according to the principles of optics. So also the pupil, connected alike with the cerebrospinal and sympathetic systems, changing its size with every heart beat, every breath, almost every thought or motion, cannot fail to give us information of exceptional nature about our patient, if we can read the signals aright.

When we investigate the structures which produce the changes in the size of the pupil, a ring of smooth muscle fibres can easily be demonstrated occupying the inner zone of the iris nearest the pupil and lying a little nearer its posterior than its anterior surface, the sphincter pupillae. That its contraction makes the pupil smaller is easy to understand.

In regard to the method of dilation physiologists are by no means agreed. (Journal of Physiology, 1892). Budge, Henle and many others claimed a dilator pupillae. Radiating fibres exist, but their muscular character has not been absolutely established. Secondly, dilatation was attributed to vascular changes, to the action of the sympathetic through the vasoconstrictor nerves. The chief advocate has been Grünhagen. Thirdly, it may be due to the inhibitory action on the sphincter. This theory requires the presence of elastic tissue in the iris

(Fuchs). Without referring to the evidence in proof of these views, it is sufficient to say that the existence of a muscular dilator seems most probable.




*On.*, optic nerve. *Oc.*, optic chiasm. *Ot.*, optic tract. *P.*, pulvinar of the optic thalamus. *Gh.*, ganglion habenulae. *Cqa.*, corpus quadrigeminum anterior. *Cge.*, corpus geniculatum externum. *M.*, Meynert's fibres. *Sph.*, sphincter pupillae nucleus. *C.*, cortex. *Pd.*, pupil-dilating center. *S.*, sympathetic fibres. *3rd.*, third nerve trunk. *N.*, nucleus of the third nerve (arrangement of the groups of cells is after Perlia). The union between the ganglia habenulae and corpora quadrigemina on either side is shown in dotted lines because it is doubtful whether these are pupillary fibres.

The nerves which control the movements of the pupil, the courses of which must be considered in detail, are the fibres of the third nerve supplying the sphincter pupillae and those of the sympathetic system supplying the dilator. The nuclei for the third nerve consist of elongated groups of ganglion cells extending from the posterior portion of the third ventricle below the aqueduct of Sylvius to a point beneath the testes. In these nuclei groups of cells governing the individual muscles of the eye are well localized and it has been established that the nuclei for the sphincter pupillae and ciliary muscles lie most anterior of all these; that is, in the floor of the third ventricle at the beginning of the aqueduct of Sylvius. The roots from the various nuclei pass through the tegmentum of the crus, emerging in one trunk from the base of the brain to the inner side of the crus cerebri and in front of the pons. The nerve pierces the dura and passing along the outer wall of the cavernous sinus enters the orbit through the sphenoidal fissure. The pupillary fibres with which we are concerned leave the branch at the inferior oblique and join the ophthalmic ganglion as its motor root. The short ciliary nerves pierce the sclerotic and passing between this and the choroid reach the iris. Irritation of the nucleus for the sphincter pupillae gives contraction of the pupil through the communication just outlined and the most important physiological stimulus to this center is *light* falling upon the retina. Hence we must trace the connection between the eye and the pupil-center.

The optic nerve collects its fibres from the retina, passes through the optic foramen and joins its fellow at the chiasm. Those fibres supplying the nasal half of each retina cross to the opposite optic tract. Each optic tract, therefore, contains fibres from the temporal half of the eye on the same side and from the nasal half of the opposite eye. Those *fibres* in the optic nerves conveying stimulus to the *pupil-contracting* centers suffer semi-decussation after the same fashion as far as anything is positively known to the contrary. Each optic tract, winding around the crus cerebri, buries itself in what are known as the three primary optic ganglia, namely, the corpus quadrigeminum anterior, the pulvinar of the optic thalamus and the corpus geniculatum externum. Experiments in the main, show the re-

lation of the former to the ocular muscles ; of the two latter, to sight (Knies). The fibres at the nucleus of the sphincter pupillae have been considered by most authorities to pass into or through to the anterior corpora quadrigemina. Meynert established the fact that a direct communication exists between these ganglia and the nuclei for the sphincter of the iris. Thus the reflex arc is complete. (See diagram.) Light falling upon the retina gives origin to an impulse which passes along the optic nerve, through the optic tract to the natis, thence by Meynert's fibres to the sphincter nucleus, starting a reflex which reaches the iris through the third nerve as described. The pupil then contracts. This course it must be said is by no means universally accepted. Mendel, for instance, experimenting on new-born cats and dogs, believes that the pupil fibres pass uncrossed to the ganglion habenulae and from there by the posterior commissure to the sphincter nucleus of the opposite side. It is not always safe, however, to draw conclusions from the lower animals.

Besides this direct reflex action to light, a so-called consensual action takes place by which the pupil of the eye into which light does *not* fall contracts at the same time and to the same degree as the other which is illuminated. This would be easy to explain if we call to mind the fact that the fibres of each eye pass into both optic tracts and thus reach both nuclei. It has been observed, however, that in case of a lesion destroying one optic tract, homonymous hemianopsia is present, but this consensual action still occurs, showing that *both* sphincter nuclei are reached from *each* optic tract. This is also shown by a case of Mitchell's where the two optic nerves and tracts were divided from each other at the chiasm, yet the consensual action took place. It is almost universally agreed that sphincter nuclei are connected together. The anterior corpus guadrigemina are also probably united across the median line. Either of these communications would explain this phenomenon.

The pupil not only contracts as a reflex to light, but also in association with convergence and accommodation. When the eyes are adjusted for a point near at hand the pupils involuntarily grow smaller. This seems to be independent of accommodation since it occurs when the lens is absent and in myopia. It appears that the three centers for convergence, accommodation

and pupil-contraction though independent, are simultaneously stimulated by *one* voluntary impulse for adjustment of the eyes to a near point. It may be mentioned that Knies considers the phenomenon purely mechanical—due to congestion of the iris by blood driven out of the ciliary body in accommodation. This view is untenable as the sole cause.

The *pupil-dilating* fibres which next demand our attention belong to the sympathetic system and are of two kinds, musculo-motor, which act upon the dilator pupillae, (granting its existence,) and vaso-motor, which contract the vessels of the iris. These two run the same or nearly the same course from the medulla to the eye as follows: Down the spinal cord to the cilio-spinal center of Budge at the seventh and eighth cervical and first dorsal segments, thence through the nerve roots and rami communicantes to the cervical sympathetic. The greater part at least pass through the superior cervical ganglion and through the carotid plexus to the cavernous plexus. From this point fibres reach the eye partly through the nasal branch of the first division of the fifth nerve, partly by direct communication between the cavernous plexus and the ciliary ganglion. Probably other paths to the eye exist.

How now, under physiological conditions, do stimuli reach the pupil-dilating center? Any irritation of the nerves of sensation act in this way. Stimulation of the skin, supplied by the fifth nerve on the face, will dilate the pupil. Psychical conditions also affect it. Persons of nervous or irritable temperament habitually have large pupils. Anger or fright act in the same manner, while in sleep or under an anesthetic the pupils are contracted because of the absence of stimuli. Thus the size of pupil depends upon ever varying sensitive and psychical influences. At the beginning of each labor pain (according to Raehlman), with a deep inspiration or expiration, in chewing, swallowing or sneezing, the pupils enlarge. As the centers for these latter reflexes are in the medulla the pupil-dilating center may be affected in association on account of its proximity. The presence of carbonic acid gas in the blood, as in strong muscular effort or holding the breath, is supposed to act as a stimulant.

There is no standard size for the normal pupil, such are the manifold influences at work. It has been said that the average

diameter in middle life with moderate illumination and accommodation at rest, is 4–4.5 mm., but in children it is greater than in the aged. People with light eyes have smaller pupils than those with dark. Far-sighted eyes generally have small pupils; in the near-sighted they are larger.

### THE PATHOLOGY OF THE IRIS MOVEMENTS.

We are now in a position to consider under what pathological conditions the pupil may be affected and whether we can gain any information from it in the diagnosis or prognosis of disease. It is my purpose to give only a brief résumé of the principal circumstances under which variations from the normal pupil may be expected. Since it is not so much the motility of the iris that concerns us as the states of abnormal dilatation or contraction, the pathological conditions which affect the pupil may be classed under two heads, namely, those which produce contraction or myosis and those which produce dilatation or mydriasis. An abnormally contracted pupil, which will be considered first, may be caused in two ways. First, by an irritation of the third nerve or its nucleus; second, by paralysis of the pupil-dilating center or the sympathetic fibres leading from it to the eye.

*Irritation* or *spasmatic myosis* is defined by Leeser as a pathological condition in which an abnormal irritation directly or indirectly affects the pupil-contracting fibres in some portions of their course from the third nerve center to the sphincter pupillae. This myosis is not increased by light or accommodation because the center is already under stimulation.

All diffuse inflammatory diseases of the brain or meninges—at least in the initial stage—may give rise to a contracted pupil due to this cause. Thus in acute meningitis, during the first stage of excitement, the pupils are small, while in the stage of oppression the pupils dilate, owing to pressure paralysis. This is not without value in prognosis, since it tells when the stage of depression sets in, which is likely to result fatally. Cerebral tumors are often surrounded by a zone of irritated tissue which is destroyed at a later period. Thus tumors situated near the third nerve nucleus or along its course give rise to an irritation, myosis followed by paralytic mydriasis.

In cases of failing sight due to tobacco poisoning, the pupils are small. This seems due to the nicotine which is known to have a stimulating effect on the pupil-narrowing fibres. The myosis characteristic of opium poisoning is ascribed to this category by Wood. Cases of apoplexy may exhibit this pupil, but the rule is that the pupil is dilated on the side of the lesion. Rupture of the extravasated blood into the ventricles produces marked myosis. Cerebral embolism, on the contrary, is not apt to give changes. This form of myosis occurs at the beginning of hysterical or epileptic seizures. (Wecker). It has been observed that watchmakers, engravers and those who habitually use the eyes for near work, have small pupils, due to a tonic contraction of the ciliary muscle from constant accommodation in which the iris participates.

Inflammatory conditions in parts of the eye supplied by the fifth nerve, especially if painful, give rise to myosis. Thus foreign bodies on the cornea, nearly all forms of keratitis, iritis, (except the serous form,) cyclitis and scleritis, are associated with a narrow pupil. In these cases myosis occurs as a result of a reflex which probably takes place at the ciliary ganglion and also on account of the congestion of the iris.

Perhaps the more common of the two forms of myosis is the *paralytic* in which the continuity between the pupil-dilating center in the medulla and the iris is broken. This myosis differs from the preceding in that the pupil reacts to light and accommodation.

Diseases which affect the cervical portion of the spinal cord may give a narrow pupil of this form called spinal myosis. Locomotor ataxia is an example of this kind. It is not this phenomenon however which is of the most importance in locomotor ataxia. What is known as the Argyll-Robertson pupil is of the greatest value in diagnosis. This together with Romberg's symptom of swaying when the eyes are closed and the loss of patellar reflex are sufficient to make the diagnosis. The typical Robertson pupil is one which does not react to light, but contracts promptly in converging to a point near at hand. The patient should gaze through the window at a distant object. When the eyes are alternately covered and uncovered, the pupils do not change their size but immediately the sight is directed to

the upraised finger the pupils contract. The site of the lesion is not hard to determine. The patient sees well (if there is no more atrophy), hence the path from the eye to the brain is intact. The pupil reacts in accommodation, therefore the nucleus for the sphincter pupillae and the third nerve are capable of stimulation (unless we grant a separate nucleus governing pupil contraction in accommodation as suggested by Heddaeus (Archives of Ophthalmology, 1894). Meynert's fibres alone remain and it is here that the break in the reflex arc probably occurs. Paralytic myosis is also found in general paralysis of the insane. About one half of the cases also show Argyll-Robertson pupil as in tabes. According to Knies the pupils may be normal in size, contracted or dilated but myosis is observed most frequently.

This form occurs in Poliomyelitis acute and chronic and in multiple sclerosis (Leeser.) During the cessation of breathing in Cheyne-Stokes respiration the pupils are small, when the respiration returns they dilate.

In deep narcosis under ether or chloroform the pupils are small from lack of stimuli—sudden dilatation is an alarming symptom accompanying paralysis of respiration. Tumors, aneurisms and wounds involving the brachial plexus or cervical sympathetic give paralytic myosis as a matter of course. Myosis is the rule in concussion of the brain, yet in some cases the pupils may be dilated or unequal. Chronic constipation and indigestion may be accompanied by myosis (McNamara). Graefe observed small pupils in cholera. Paralysis of the Trigeminus gives myosis from interruption of the sympathetic fibres which join this nerve in part of their course to the eye.

Maximum myosis combining the two forms in which the sphincter is irritated and the dilator paralysed is sometimes seen. Myotics such as eserine and pilocarpine which are commonly used in the eye act in this way.

The following drugs produce myosis when given in poisonous doses: alcohol, carbolic acid, chloral, eserine, pilocarpine, muscarine, nicotine, ether, chloroform, morphine and iodoform.

The opposite condition, i e. a dilated pupil, can also be divided into two forms—spasmatic or irritation mydriasis and paralytic mydriasis.

The former depends upon an irritation of the sympathetic fibres

which were paralysed in the myosis last considered. The pupil under these circumstances is moderately dilated but contracts somewhat to light and convergence. Among the conditions which show this mydriasis are irritation of the cervical portion of the cord, such as in hyperemia or spinal meningitis. So also tumors in the upper part of the cord in the early stages. Spasmatic mydriasis is likewise a symptom of so called spinal irritation found in nervous and anemic individuals, or those wasted by disease, e. g., after typhoid, and also occurs in hysteria or hypochondria. This sometimes appears as an early symptom of tabes and in diseases of the brain or cord which later show paralytic myosis.

Diseases accompanied by high intracranial pressure like hydrocephalus or injuries causing compression of the brain, almost invariably dilate the pupil from irritation of the center in the medulla, but this is also undoubtedly partly caused by paralysis of the pupil-narrowing fibres from pressure at the base of the brain.

As we saw in considering the physiological action that irritation of the nerves of sensation tends to stimulate the pupil-dilating center, it can readily be understood why intestinal irritation from worms and in lead colic or the passage of biliary or renal calculi or a carious tooth should act in the same manner.

As emotions give rise to dilatation so do mental diseases characterized by psychical excitement; e. g., forms of insanity, as acute mania and melancholia. Physiological reflexes like swallowing have a perceptible effect on the pupil: so coughing, vomiting, choking and convulsive seizures like epilepsy or eclampsia would act in the same way from association of the reflex centers in the medulla.

Conditions of hindered breathing with retention of carbonic acid gas in the blood stimulate the centers in the medulla; likewise interferences with the circulation or respiration which impoverish the blood are to be mentioned. Spasmatic mydriasis occurs in phthisis, either due to anemia or hindered breathing and carbonic acid gas in the blood. Paralysis of accommodation after diphtheria is exceptionally accompanied by mydriasis. In the spasmatic form of hemicrania with anemia there is mydri-

osis. The pupils are said to dilate during and after a malarial paroxysm. In exophthalmic goitre spastic mydriasis is present, sometimes unilateral. Spasmatic dilatation may occur as a sexual neurosis, (Mitchell).

Cocaine dropped into the eye dilates the pupil by stimulation of the peripheral nerve-endings of the sympathetic and shows also slight exophthalmus and widening of the palpebral fissure from stimulation of the smooth muscle fibres in the lids.

The last variety, *mydriasis paralytica*, occurs from a lesion, involving the pupil-contracting center or the third nerve and also from want of stimulus to this center by light in lesions of the optic nerve or tract. In fact a lesion occurring in any part of the reflex arc as described will produce this "reflex rigidity." This is the most common form, at least from an ophthalmologist's standpoint. Mydriasis, either with or without involvement of other muscles supplied by the motor oculi, due to lesion at the nucleus, is of fairly frequent occurrence and almost always specific. Such nuclear paralyses may also complicate bulbar paralysis, progressive muscular atrophy, disseminate sclerosis or tabes in its initial stage. They may be due to inflammatory processes, hemorrhages, tumors, or occur without post-mortem findings. Diseases of the brain or meninges, especially at the base, which give riso to irritation myosis, produce paralytic mydriasis in the later stages. Again, tumors, hemorrhages, inflammations in the orbit, may be followed by paralysis of the ciliary nerves. New growths in the eye itself, or glaucoma, which increase intraocular tension, give a wide pupil from pressure on the nerves.

If light fails to reach the pupil-dilating center through loss of function of centripetal fibres in retinitis, optic neuritis, optic nerve atrophy, (occurring alone or accompanying general diseases, inflammation of the brain or brain tumors), the pupils are large and irresponsive to light. It is observed that a blow upon the eye will dilate the pupil temporarily by paralysis of the sphincter. At the time of death the pupil dilates, owing to oculomotor paralysis. Within an hour after death, it comes to medium dilatation.

A condition of maximum mydriasis by stimulation of the sympathetic and paralysis of the third nerve is produced by

atropine, duboisine and other mydriatics used in the eye which act in this way upon the peripheral nerve endings.

The following drugs produce dilatation of the pupil when given in poisonous doses: Atropine, carbonic acid, cocaine, potassium cyanide, digitalis, ergot, hyoscyamine, santonin, cannabis indica, amyl nitrite and quinine.

*Inequality* in the size of the pupils is always abnormal. There is, however, a not very uncommon class of cases in which there seems to be no good reason for the difference in size. The eyes and general condition are perfectly normal in other respects. Sometimes a difference in refraction causes slight inequality, and of course any mechanical hinderances to the movements, like adhesions after iritis, must not be overlooked. Either of the varieties of myosis or mydriasis may be unilateral, but one-sided lesions of the eye, optic nerve or tract will give equal pupils because the consensual action can take place through the other side. Alternating one-sided mydriasis may precede mental disease. (Graefe).

The reactions of the pupil in connection with the investigation of the accommodation, sight and movements of the eyes, are of considerable value as an aid to the localization of cerebral lesions. Enumeration of the effects produced by lesions in the various situations would not be without interest, yet a thorough understanding of the anatomical and physiological relations, with the use of a diagram, makes these problems easy to solve.

The following cases, which I have seen within the past few weeks, will illustrate some of the pupil changes:

I.—Male, thirty-five. Consulted me because the right pupil was larger than the other and because he could not see to read with that eye. Occasionally he saw double. Found moderate dilatation Rt. No reaction to light on convergence. Consensual action Lt., good. Rt., vision for distance good, no accommodation for the near point. Right internal rectus paretic. Specific history. Lesion could not be in the eye, optic nerve or primary optic ganglia, because sight is good; not in Meynert's fibres alone because accommodative reaction would still be retained. Could not be in the trunk of the third nerve because all the muscles supplied by it would probably be affected. Hence, diagnosis by exclusion, specific lesion in the anterior part of the right oculo-

motor nucleus involving centers for the pupil and accommodation with that for the internal rectus partially affected.

II.—Female, thirty-three. Exophthalmic goitre. Rt. pupil dilated, reacts slightly both to light and accommodation. Sight good. Could not be mydriasis paralytica because of the reaction to light. Hence, due to irritation of the sympathetic, perhaps in the neck near the goitre.

III.—Female, twenty-three. Meningitis two months ago. Pupils both large. No reaction to light. Slight reaction on convergence. Eye staring, restless, no perception of light in either eye. Discs show optic neuritis passing over into atrophy. Mydriasis evidently due to want of stimulus to the pupil-contracting center because of atrophy of the optic nerve.

IV.—Male, forty-eight. Sight good. Pupils small. No reaction to light, but promptly on convergence. Argyll Robertson pupil. Patient has advanced locomotor ataxia.

V.—Female, thirty-seven. Has mental disturbance, sent in consultation for suspected brain lesion because of inequality of pupils. Left pupil large, reacts to light and accommodation—sight good with glasses to correct myopia. Right pupil small, immovable because the iris is bound down by old iritic adhesions. Diagnosis—Left eye. Possibly irritation mydriasis in connection with mental disorder. Inequality entirely mechanical.

I would refer to the following authors as the best on this subject and from whom I have freely drawn in the preparation of this paper:

*Leeser.*—Die Papillarbewegung, 1881.

*Konigstein.*—Physiologie und Pathologie der Papillarreaction, 1888.

*Magnus.*—Entstehung der Papillenbewegung, 1889.

*Knies.*—The Relations of the Eye to General Diseases, 1895.

# REPORT

OF THE

# COMMITTEE ON MATTERS

OF

# PROFESSIONAL INTEREST

IN THE STATE.

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I. TYPHOID FEVER.

II. THE USE OF DIPHTHERIA ANTITOXINE IN CONNECTICUT.

III. INTERESTING CASES IN PRACTICE.

# REPORT OF THE COMMITTEE

## ON MATTERS OF PROFESSIONAL INTEREST IN THE STATE.

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### I. TYPHOID FEVER.

To the questions on typhoid fever, sent out by this Committee, we have received formal replies from one hundred and twenty-eight members. From these papers it appears that the typhoid fever which has occurred in this State during the past few years has been, for the most part, mild in type. There have been, however, many exceptions to this rule, one of the most notable of which was the epidemic that occurred last autumn at Hopewell, a little village in South Glastonbury, in which out of twenty-four cases there were six deaths. An account of this epidemic will be presented to this Convention in a separate paper by Dr. Rankin.

The rose spots have been pretty generally present; sometimes absent, or, as some physicians have guardedly reported, they have not always been found when carefully looked for.

Petechiae.—Some of the answers as to the prevalence of petechiae in typhoid fever are rather surprising. Four physicians report them as having been present in all of their cases; six, in nearly all; four, in more than fifty per cent., four, in fifty per cent.; three, in thirty per cent.; two, in twenty-five per cent., and one in from fifteen to twenty per cent. As petechiae are rare in this fever, mistakes have evidently been made here, either in confounding petechiae with the rose spots, or in estimating their frequency without careful observations and records made at the bedside.

Diarrhea.—Diarrhea was a prominent symptom in the practice of less than one third of the reporters; with the other two thirds it was either mild or absent. In some instances constipation is mentioned.

Intestinal Hemorrhage.—To the question: How many cases of intestinal hemorrhage have you seen? there were one hundred and sixteen replies. Thirty-eight had had no cases at all. Of the remainder, seventy-five had variously seen all the way from one to six cases each; one, twelve cases; another twenty cases in thirty years, and another twelve cases in forty years. The frequency of this complication varies greatly in different epidemics. Osler says that it occurs in from three to five per cent. of all cases.

Perforation.—There were one hundred and nineteen responses to the questions relating to perforating ulcer of the intestine. Eighty reported that they had not seen a case. Of the remaining thirty-nine, twenty-seven had each seen one case; ten, two; and two, three cases each, making fifty-three cases all told, out of which five recoveries took place. This large per cent. of reported recoveries is sufficient to show that occasional errors in diagnosis were made. It is probable that peritonitis, without perforation, was the condition from which some of these patients were rescued. Flint says: "Probably in most of the reported cases of recovery after the occurrence of peritonitis, perforation was not involved:" Loomis, that "when perforation of the intestine occurs, the case may be regarded as hopeless." Osler, that "recovery from perforatiou is undoubtedly possible, though rare."

Relapses.—Thirty-eight physicians report that they have had no cases at all of relapse. Eighty-eight have seen from one to several cases each. One reports four relapses in thirty-one cases; another, eight in 1893; another, from one fourth to one third of all his cases; another, one third of all his cases. As genuine relapses to the extent of one fourth to one third of all cases greatly exceeds the highest per cent. given in the standard test-books, it is obvious that the temporary fever which occasionally happens in convalescence, usually from errors in regimen, has sometimes been put down as a relapse. These recrudescences run their course in from one to four or five days, which is never the case with a true relapse.

Immediate Causes of Death.—The answers to this question indicate that the immediate causes of the majority of all deaths

from typhoid fever are exhaustion from cardiac weakness, hemorrhage, and perforation. The other causes mentioned are pneumonia, hyperpyrexia, meningitis and other cerebral complications, acute nephritis, pleurisy, hiccough, and hepatic abscess. One case, which seemed to be progressing favorably, died very suddenly, apparently from syncope. These cases of sudden death are sometimes due to fainting from the cerebral anemia, caused by rising from the recumbent to the sitting or standing posture, as explained by Liebermeister. But, according to Osler, not all of these sudden deaths in typhoid fever can thus be accounted for.

The Source of Infection.—Fifty-four correspondents answered that they had not generally been successful in discovering the sources of the typhoid poison in their cases; twenty-one, that they had been able to trace the infection to contaminated wells, springs, or other sources of water supply. Polluted drinking water is probably the most common cause of typhoid fever in the country and in villages. The origin of epidemics from wells or springs, either from drinking the water, or through milk from dairies where such water had been used for washing and rinsing the cans and pails, has been so frequently demonstrated within the past few years that we need not dwell further on this point.

There are two instances reported to us of supposed infection from handling soiled clothing. One from a public laundry in New Haven, where two young men, who were brothers, were engaged in handling the clothes before they were washed. Both were taken with the fever at about the same time. The other instance was that of a washerwoman and her son in Derby who apparently contracted the fever from washing soiled clothing.

Closely related to the mode of infection in these cases are the following: Three nurses in charge of typhoid fever patients in the Hartford hospital in the autumn of 1894, were taken sick with the disease. At the time they were caring for several cases of typhoid fever, among which were five from the Reed family at Hopewell. In this family, as will be seen from Dr. Rankin's paper, the introduction of one person sick of typhoid fever caused seven other cases of a virulent type, *the infection taking*

*place from one to the other, apparently through household fomites, and not through the drinking water, which was above suspicion.*

Another case was that of a man taken with typhoid fever in the summer of 1894. He insisted upon being removed from his boarding house on Governor street, in Hartford, to the house of a friend on Pleasant street. The case was a long one and six weeks after entering the house the woman who had taken care of him was seized with typhoid fever, which ran four weeks. During the last week of her illness her husband was taken with typhoid fever, which lasted three weeks. The apartments of the house were small and poorly ventilated. There was no well or privy in the dooryard, the drinking water was that supplied by the city, and the water-closet into which the stools were thrown emptied into the public sewer.

That typhoid fever can be communicated by handling the soiled clothing and bedding of patients sick with the disease has been maintained by many writers since this doctrine was advanced by Gendron about 1840. This view is held to-day by such authorities as Liebermeister, Strümpell and Osler, and is undoubtedly correct. The belief that the disease can be transmitted directly from a person sick with it to another, such as a nurse or attendant, has been held by many competent observers ever since the distinction between typhoid and typhus fever has been established. In favor of this view may be mentioned such names as Nathan Smith, Bretonneau, James Jackson, Gendron, Louis, Strümpell and Osler. This doctrine of direct contagion has also been denied by many able clinicians, such as Andral, Pettenkoffer, and Loomis. Cases of direct transmission, as well as through the medium of soiled clothing, are certainly not at all common. The cause in both is undoubtedly the same, viz.: the fortuitous entrance into the alimentary canal of the nurse or washerwoman of the specific germs of the disease, contained in the stools of those sick with typhoid fever.

Several cases of infection from the inhalation of sewer-gas, and the foul air from privies and cesspools, have been reported to this committee, and two physicians express their belief that the typhoid poison may be spontaneously generated in such places.

The doctrine of the spontaneous origin of the typhoid fever poison from decomposing animal and vegetable matter, as

taught by Murchison, has been very generally abandoned. We now know that it is necessary for the contents of sewers, privies and cesspools to be infected with the specific germs of typhoid fever, derived from some person sick with the disease, before their emanations can produce typhoid fever in others. We may go even a step farther and question to what extent the emanations or gases escaping from such infected privies and sewers are capable of producing typhoid fever. Modern investigation tends to show more and more that the poison of typhoid fever is not conveyed so much by the atmosphere as was formerly supposed. Osler goes so far as to say that it does not seem probable that typhoid fever is communicated by the air alone, as, for instance, through the medium of sewer-gas. It would be interesting to experiment at the mouth of a covered cesspool into which typhoid stools had been emptied to determine whether the gases escaping contained the specific bacilli of typhoid fever.

Cases of typhoid fever traceable to the oysters eaten at Wesleyan University, in October, 1894, are reported by two physicians. As the cause of the Middletown epidemic has been thoroughly investigated by Professor Conn, and the results published in the Seventeenth Annual Report of the State Board of Health, nothing that we can say will add to its value and interest, except, perhaps, to mention that the particulars of eleven cases of typhoid fever occurring in seven separate families in England, in the autumn of 1894, all supposed to be caused by eating oysters, are published in the British Medical Journal, January 12th, 1895, by Sir William Broadbent, who saw the most of them in consultation.

Dr. Broadbent adds: "Other cases, in which the evidence was equally convincing, have come to my knowledge, although the patients have not been under my care, and I have seen several cases of typhoid fever in gentlemen engaged in the city, their families at home not suffering. On inquiry it has been found that they frequently took oysters for lunch."

In an editorial in the same number we read that "the present is not the first occasion upon which grave suspicion has fallen upon oysters. A similar suspicion was entertained with regard to certain cases which occurred in 1890, in Dublin, and as long ago as 1880 Sir Charles Cameron reported cases at the Cam-

bridge meeting of the British Medical Association, in which the consumption of certain oysters had produced intestinal disease of a serious character."

We also learn from the British Medical Journal for April 20th, 1895, that oysters which had been exposed to the sewage from Cleethorpes and Grimsby, at the mouth of the Humber River, are now suspected as having been the carriers of the bacilli which produced many of the cases of cholera which occurred in England in 1893.

Treatment. Food.—The food on which almost every one of our correspondents relies in typhoid fever is milk. It is given, usually plain, sometimes either peptonized or sterilized, and occasionally in the form of koumiss. Lime water is often added to the milk; sometimes it is diluted with vichy or seltzer water. A few physicians report that they use skimmed milk or buttermilk to some extent. Beef juice, beef-tea, mutton-broth, clam-broth, the whites of eggs, and thin gruels from well-cooked cereals, are each given more or less either with the milk for the sake of variety, or when the milk is not relished or well borne. The adoption of milk as the principal food in typhoid fever is a great advance in its treatment, and has taken place well within the memory of many of the oldest members of this Society, and since the days in which Watson's Practice of Physic was the standard test book in medicine.

Treatment of the Fever.—The means used to reduce temperature have been bathing and the internal administration of antipyretics. The extent to which bathing has been practiced may be gathered from the following figures. Of one hundred and nineteen physicians answering on this point, one hundred and three had employed baths in some form, and sixteen had not. It is quite likely, however, that some of these sixteen intended to say that they had not used the tub bath. Of those who bathed, ninety used the sponge bath or wet pack and sometimes both; five used the tub bath; two, the tub bath when it was possible, when not, sponging; and six did not report their method of bathing.

The temperature of the water used for bathing in bed was made to vary all the way from tepid to ice cold, the rule being cool or cold. Alcohol was sometimes added to the water. The

temperature, duration and frequency of the baths were graduated to the requirements of individual cases. When the temperature of the patient was high and persistent, many physicians went from cold sponging to the wet pack.

With a single exception the results reported to our committee from the use of bathing were favorable. The following are a few of the answers received: "Invariably favorable;" "Extremely favorable;" "Saves lives;" "Baths are my main dependence;" "The most important single remedy."

The systematic employment of baths is, without doubt, the best means that we have to-day for combating the temperature in typhoid fever. But the most favorable results have been obtained from immersion after the manner of Brand. This method, however, cannot be carried out very well in most cases in private practice. The general practitioner is, therefore, confined to such bathing as can be accomplished in bed.

In mild cases ordinary sponging is all that is required. In cases of moderate severity the more thorough and skilful use of the sponge bath will usually be found sufficient. In high and stubborn temperatures there are yet two very efficient methods to resort to; one is the wet pack; the other is the plan worked out and very successfully used by Dr. Hall, while an intern at the Hartford Hospital, and which will be set forth in the paper which he has prepared, by request, for this meeting.

Antipyretic Drugs.—There were replies from one hundred and seven members as to their use of antipyretic medicines in typhoid fever. Out of this number sixty-four have either discarded them or do not give them because they consider their effects unsatisfactory or dangerous; ten have sometimes given them at the onset of the fever when the headache and muscular pains were violent—for the fever in "sthenic cases"—and sometimes for hyperpyrexia when other means had failed; twenty-four reported good results from their use; and nine simply that they had given them, without expressing any opinion as to their value.

The antipyretics mainly employed, and which are here referred to, are phenacetin, antipyrin, and acetanilid. Other coal-tar products, such as kairin and thallin, have been used to a very limited extent.

The following are extracts from a few of the answers of those who consider these drugs dangerous: "Have seen bad effects from acetanilid several times;" "Acetanilid will reduce the temperature, but depresses the heart;" "Phenacetin, acetanilid, and antipyrin reduce the temperature for a short time, but retard recovery: have not used them in later years;" "Am afraid of them;" "Antipyrin disastrous, kairin disastrous, acetanilid unsatisfactory, thallin unsatisfactory;" "Coal-tar products produce marked reduction in temperature, which is temporary. I believe them dangerous:" "My past experience is against them."

The consensus of the profession to-day appears to be, that while the coal-tar antipyretics are excellent remedies for neuralgias, in complicated influenza and in minor febrile affections, their frequent use in such grave diseases as pneumonia and typhoid fever is unwise and fraught with danger. They are unnecessary in mild cases and dangerous in the severe, where altogether the safest and best way of controling the pyrexia is by means of baths as above described. In an editorial note to Strümpell's article on typhoid fever, Dr. Shattuck says: "A strong protest should be entered against the routine or frequent use of any of these internal antipyretics. If the temperature seems, in itself, to cause restlessness and discomfort, an occasional dose may be given. When used early in the course of the disease, antipyretics may seriously embarrass the diagnosis in doubtful cases."

Quinine.—One hundred and fourteen physicians answer as to their use of quinine in typhoid fever. Of these fifty-four prescribe it in small or tonic doses; forty-six give it variously. Of the latter, twelve in antipyretic or large doses; one reporter saying that the amount with him was always twenty to thirty grains daily, and more if the fever continued high; another, twenty grains every four hours till a decided reduction in temperature took place; another saturates the patient early and then discontinues its use. Several of this group of forty-six give it in the beginning of doubtful cases as an aid to diagnosis. Fourteen physicians do not give quinine at all in this disease.

Two influences have contributed largely to the use of quinine in typhoid fever in this State. One was the last epidemic of

malaria which began in earnest from twenty to twenty-five years ago. The other was the teachings of Liebermeister, whose article on typhoid fever in Ziemssen's Cyclopedia was translated and published in this country in 1874. The tendency at the present day appears to be against the free use of quinine in typhoid fever.

Intestinal Antiseptics.—Of the one hundred and nine members who replied to this question, forty-seven stated that they had not observed beneficial results from the internal use of antiseptics. The other sixty-two thought that they had obtained more or less good from them. The drugs employed were twenty-five in number, but only a few of them were given to any considerable extent. These were: Salol, by twenty-three reporters; sulphocarbonate of sodium and zinc, by ten; tincture of iodine, by eight; carbolic acid, by seven; calomel, by six; turpentine, by six; the preparations of bismuth, by six; and the bichloride of mercury, by four.

One physician finds that salol in doses of from five to ten grains every four hours reduce the severity of the disease by its antiseptic action; that it prevents diarrhea, and lessens the tendency to deep ulceration. Out of forty cases in which it was given there was not an instance of hemorrhage or perforation, very seldom a troublesome diarrhea, and all the patients recovered. Several other physicians have had similar experiences with this drug. It is, perhaps, well to bear in mind that fully one-third of salol is made up of carbolic acid, which latter is set free in the small intestines; so that with each dose of ten grains of salol the patient receives more than three grains of carbolic acid, which is a large dose. It may also not be amiss to state here that Osler has found in his experience that carbolic acid, iodine, and beta-naphthol are inefficient remedies in typhoid fever.

That calomel and corrosive sublimate act as intestinal antiseptics is well known. They are, however, remedies with which the profession has long been acquainted, and anything like their free or general use in such a disease as typhoid fever is to be regretted. There may be a few instances in which an initial dose of calomel would be beneficial, but to give twenty to thirty grains during the first day of treatment, after the manner of

Liebermeister, is rather heroic practice, to say nothing of the risk of salivation, a condition which would certainly add to the danger and discomfort of the patient.

Thymol has been used by two of our correspondents; by one without apparent success, by the other with good results. Dr. Frederick P. Henry regards thymol the best medicine that we possess for intestinal antisepsis. In his article on Typhoid Fever in Hare's Therapeutics, published in 1892, he says: "In every case in which I have employed this drug at an early stage of the disease the tongue has become rapidly clean and moist, and has so continued; tympany has speedily subsided or has never made its appearance; diarrhea has diminished without being followed by constipation; there has been no delirium; and finally, the temperature has gradually subsided and remained within moderate bounds. The virtues of thymol are explained on the principle of intestinal antisepsis. In the first place, its antiseptic power is four times greater than that of carbolic acid, and its poisonous effects ten times less. Secondly, it is so insoluble as to reach the small intestine, and there exert its powerful antiseptic effect."

Treatment of Diarrhea.—The remedies employed for this symptom by almost every reporter were bismuth and opium, either separately or combined. A few give the acetate of lead with opium. Salol was given by twenty-one, sometimes alone, but oftener with bismuth or opium, or both. Others to the extent of about ten rely on such antiseptics as sulphocarbolate of sodium and zinc, Listerine, aristol, turpentine, calomel and corrosive sublimate. Many refer to the importance of watching the stools for evidences of indigestion, and when this is present, the milk should be restricted in amount or temporarily replaced by beef juice or other suitable nourishment.

Treatment of Intestinal Hemorrhage.—The drugs upon which the most of the ninety-six members who responded to this mainly rely for checking intestinal hemorrhage are preparations of opium and ergot, administered for the most part either hypodermically or by the mouth, but sometimes by enema. Acetate of lead was given by nineteen, and other astringents, such as tannic and gallic acids, to a moderate extent. Turpentine was used by eight physicians. Ice was applied to the

abdomen by thirty-four of the ninety-six reporters. Absolute rest was aimed at, and the amount of food given by the stomach was much lessened during the hemorrhagic period.

Treatment of Perforation.—From the thirty-six members who have reported their experiences with perforation, we gather that in many cases the resulting collapse is so profound that the administration of stimulants and the application of external heat are of no avail. If, however, the patient is able to react from the shock, the pain and impending peritonitis demand the use of opium, which is invariably given. Indeed, the only hope for these sufferers in the past has been in the skillful use of opium.

The rapid advances made within the past few years in abdominal surgery have brought these cases within its scope, so that already a number who otherwise would have perished have been saved by laparotomy. No instances of laparotomy for this accident have been reported to our committee, but that some of the members are ready for it in suitable cases may be seen from such replies as the following: "Opium and stimulants; this was many years ago; would now consider laparotomy;" "Believe that some of these patients might be saved by operation;" "Died too soon to realize any results from treatment. It was before any doctor in town was prepared to perform laparotomy;" "Both died very soon after the perforation, and to me it seems as if the only treatment would be by the surgeon." The results obtained in this new field of surgery, and the hopes that these results have excited will be presented here to-day by Dr. Wiggin in a carefully prepared paper.

Typhomalarial Fever.—One hundred and thirteen physicians responded to our questions relating to typhomalarial fever. Of these, eighty-one answered that they had seen no cases at all, and several of them that they did not even believe in the existence of such a disease. One physician in this group of eighty-one made the following reply: "No case that I was sure of, as I did not find the plasmodium malariae." The remaining thirty-three respondents had seen cases of the disease, and for the differential diagnosis trusted to such points as the following: "Begins with chills and fever, bilious and malarial symptoms with remissions, and in a few days develops diarrhea, tympanites and frequently the spots;" "Periodicity and rose

spots;" "Cases which appear like typhoid fever, but which do not progress favorably without the free use of quinine."

In his admirable paper on "Malaria in Connecticut," published in the Fourth Annual Report of the Connecticut State Board of Health, the late Dr. C. W. Chamberlain says: "Typho-malarial fever has been very common, often epidemic. Its onset is more sudden and sharp than typhoid; there is no evidence that it is conveyed by the dejections, as in typhoid; diarrhea is not always present. The eruption is different, a sudaminous eruption, that is, of small watery pimples, is characteristic but not always present. The temperature range is higher, and in typhoid would indicate a fatal result; there is a period of high fever once or twice during the day, with or without a chill or cold stage; nausea and vomiting are common symptoms, the convalescence is tedious, and often tertian ague is left. The patient does not fatten up a year or so after as is often the case after typhoid."

The name, *typho malarial*, was given by Woodward, in 1862, to a fever supposed to be produced by a combination of the typhoid and malarial poisons. The belief in a fever of this mixed type was held by Wood so long ago as 1847, and since 1862 it has become very prevalent in this country. Descriptions of it have found their way into our standard text-books, such as Flint, Loomis, and Clymer's Aitken. Deaths from typhomalarial fever began to be reported in New Haven in 1877 and in Hartford in 1878, and continued to be reported for many years.

At the present day very grave doubts are entertained by many of our ablest clinicians as to the existence of such a disease. They believe with Osler, that "a majority of the cases of so-called typhomalarial fever are either remittent or true typhoid," and "that future observations will show that there are only two forms of these continued fevers in this country, the one due to the typhoid, and the other to the malarial infection."

The discovery by Laveran, in 1880, of the specific germ of malarial fever has rendered the study of this question more scientific and exact, and time only is required for its final solution and settlement. In a recent communication to us regarding the experience at the Johns Hopkins Hospital, in Baltimore, Dr. Osler says:

"We have not had, however, among four hundred cases of typhoid fever, all with blood examinations, a single instance in which the malarial parasites were present, and as a large proportion of our cases come from malarial regions, it shows that the combined infection is really not very common."

In closing, we desire to call attention to the great reduction in the number of deaths from typhoid fever in New Haven and Hartford Counties during the prevalence of the so-called typhomalarial fever, the reduction being about equal to the number of reported deaths from the latter disease. This is an interesting fact; for, if these typhomalarial cases were largely remittents, it would tend to uphold the old doctrine of antagonism between the typhoid and malarial poisons. If, on the other hand, the typhomalarial cases were mostly those of true typhoid fever, it would tend to show that the prevalence of the malarial poison so masks and alters the symptoms of typhoid fever that the latter is not easily recognized by many of the ablest physicians. Osler tells us that "Dock has shown conclusively that cases diagnosed in Texas as continued malarial fever were really true typhoid."

# PERFORATION IN ENTERIC FEVER; ITS SURGICAL TREATMENT.

BY FREDERICK HOLME WIGGIN, M.D.

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There is no complication of enteric fever more dreaded by the physician than perforation. It occurs in about two per cent. of all cases. Its most frequent causes are improper diet, distension of the bowel from any cause, or too early and sudden movements of the patient. It is present as often in mild cases as in those which are severe and is most frequently met with in young adult males. As is well known, its recognition is not difficult. Its occurrence is announced by the advent in the course of the fever of sudden severe pain in the right iliac region, accompanied by symptoms of collapse, this being soon followed by the symptoms of peritonitis, and almost invariably on the second or third day the case terminates fatally. The site of the perforation is generally found to be in the last twelve inches of the ileum.

The late Prof. Loomis, in the conrse of the discussion on Dr. Reeve's paper on typhoid fever, read before the Association of American Physicians in 1890, said: "I do not remember to have seen a single recovery after there were unmistakable evidences of intestinal perforation. Recovery from a localized peritonitis, complicating typhoid fever, is not uncommon, but when characteristic symptoms of intestinal perforation are present, in my experience a fatal issue soon follows." With such evidence and our own individual experience of the hopelessness of the patient's condition when reliance is placed on Nature's efforts at repair, (spontaneons recovery resulting less frequently in this than in other forms of perforation, on account of the central location of the injury), it is not to be wondered at that with the constant reports of successfnl operations for the relief of perforation from other causes and in other locations, the physician should turn toward the surgeon, asking if among the good tidings modern snrgery is proclaiming to many suffercrs there is not some message of hope for the unfortunates whose condition

we are considering, who seem at present to be condemned to an untimely death, and by whose bedsides he has so often stood with folded hands, helpless to aid them Said Dr. Bontecou, of Troy, New York, the first in this country to operate for this form of perforation, in the course of the discussion on Dr. J. Ewing Mears' paper, read before the American Surgical Association in 1888: "I claim that when this mortal accident occurs laparotomy cannot impair, but may improve the patient's chance of recovery." Said Dr. Van Hook, in his admirable paper reporting the first successful case of operation for perforation occurring in the course of a closely diagnosticated case of enteric fever: "It is strange, nevertheless, that a question involving the only promise of help for five and seven-tenths per cent. of all those dying of typhoid fever should not have excited even more interest and discussion." Dr. Robert Abbe, in a recent report of a case, also successfully operated upon, (Medical Record, January 5th, 1895), said: "Why one class of cases should be left to die, while we operate on all appendicitis cases, when perforation can be recognized, does not appear." Again, said Prof. Kussmaul, of Strasburg, some time since: "Granted that the chance of a successful issue is heavily against you, that the patient is in the midst or at the end of a long sickness, that his tissues are in the worst state to stand the injuries of the surgeon's knife, that the lesions of the gut may be extensive, that the vital forces are at the lowest ebb, no one yet has hesitated to perform tracheotomy in the laryngeal complications of enteric fever which require it to save life, for these reasons."

With this testimony and much more that could be offered in favor of operation, one cannot help being surprised in looking over the literature of this subject, to find on record only twenty-four cases, of which six recovered. If those cases are rejected in which there is doubt of the diagnosis, we find only seventeen cases where an attempt has been made to relieve the patient's desperate strait by surgical means. Of these three recovered. Allusion has already been made to the first and third, and the second recovery belongs to Dr. Netschajau, of St. Petersburgh, (Medical News, Dec. 1st, 1894). The writer's opinion, formed after a careful study of the subject and from a considerable experience in abdominal operations when the patients were septic

and consequently in bad condition, is that the physician on taking charge of a case of enteric fever should prepare himself to act with promptness on the occurrence of perforation. It is well to remember that while there should be the least delay possible, these patients rarely die in the first state of collapse and that this condition is not one favorable for operation. The patient, as soon as the diagnosis is made, should be stimulated by means of strychnia and morphia. If the patient rallies then the operation should be performed without loss of time and under favorable conditions there is a fair chance of success, especially in those cases in which the course of the fever has been mild or where the perforation has occurred during convalescence. Of course, if the patient refused to respond to the stimulation, the operation would be useless. Dr. Abbe, in the paper previously alluded to, said: "Very essential do I consider it that the surgeon should never be so hasty in getting at his work that he enters upon it handicapped by poor assistance, poor light or poor arrangements for irrigation." While the patient is being stimulated, the necessary arrangements for the operation can be made. The writer's experience has shown him that a laparotomy, although the personal care and trouble is greater, can be even more safely performed in a farm-house with good surroundings than in a city hospital. All that is requisite is a clean light room, without carpet or furniture, except two or three wooden tables, an abundant supply of hot and cold soft spring water which has been sterilized by boiling, and a dozen towels.

Patients of this class do not bear anesthesis well and in fact the great danger comes from this source. With a closed inhaler of the Clover type, or Dawbarn's modification, which the writer has used with satisfaction for some years, patients can be readily anesthetized and kept unconscious for an hour with four ounces of ether. The incision should usually be in the median line between the umbilicus and the pubes, rather than over the site of the pain, true as this guide generally is to the point of perforation, for from this point one has the abdominal and pelvic contents under command. Search should first be made in the pelvis because collapsed small gut and extravasated matter tend to fall into this cavity, as has been pointed out by Bland Sutton,

(Clinical Society Reports, London, March 9th, 1894). If the inflamed and perforated intestine is not found here the cecum should be sought, and the last foot of ileum is then easily located and looked over. When the injured point is found, the perforation should be closed if possible by Lembert's or Halsted's mattrass sutures and should then be covered by an omental graft. The sutures for closing the abdominal wound should now be placed, all the layers of this wall being included. These sutures should be of silk worm gut. When this has been accomplished the abdominal cavity should be freely irrigated with a hot saline solution, (half a dram to the pint,) about two gallons being used, the temperature of the water being from one hundred and ten to one hundred and fifteen degrees Fahrenheit, according to the degree of shock the patient is suffering from and in most cases the abdominal cavity should be left filled with the irrigating fluid, and the sutures already passed should be drawn and tied. If effort has been made by nature to shut off the perforated point by adhesions before they are disturbed the general cavity should be shut off by sponges or gauze. In some cases all that would be advisable to do would be to draw the perforated intestine into the wound and after free irrigation of the abdominal cavity it should be stitched to the wound or surrounded by gauze, further procedure being delayed till a future occasion. In a still more desperate case, one occurring earlier, when the fever was at its height, or in which the fever had run a severer course, one might with the aid of cocaine anesthesia rapidly open the abdominal cavity over the site of greatest pain, and after irrigating, surround the perforated intestine by gauze, thus shutting off the general cavity, favoring the formation of adhesions and securing drainage, as has been suggested by my friend, Dr. E. D. Ferguson, of Troy, N. Y. In one of the successful cases previously alluded to, Netschajaus, a portion of the perforated intestine was excised, and now that an anastomosis by means of the Murphy button can be easily effected in five minutes, it may in favorable cases, especially in those in which a number of ulcers are near together and in a dangerous condition, be quicker and wiser to excise the diseased intestine. The decision as to the best procedure must be determined by the circumstances of each case and by each operator for himself. It

is here that skill and experience count for the most. Personally, I favor closing the abdominal wound after free irrigation, leaving the abdominal cavity full of the hot fluid, as I know from many past experiences how much this procedure does to lessen shock and to prevent the danger of septic infection of the peritoneum. If at this time shock were still great it would be wise to follow Dr. Abbe's advice to administer an enema of black coffee and whiskey on the operating table.

In conclusion, may we not all agree that in many cases of perforation occurring in the course of enteric fever an attempt should be made to save the patient by operation. The patient should be freely stimulated on the occurrence of this accident and careful preparation ought at once to be made for the operation. Time should not be purchased at the expense of experience, light or competent assistance. The smallest possible amount of ether should be used. The surgical procedure should be the least that offers hope of recovery to the patient. We must remember that the chance of a successful termination of our work increases with every dram of ether and every minute saved. Finally, the physician must realize more fully that the surgeon is his assistant and not his rival and must give him as well as the patient a fighting chance by calling him early and not after several days of hesitation which has too often been the case in this and other forms of intra-abdominal disease.

Under favorable conditions I am convinced that modern surgery has a remedy to offer these patients and that in the near future the mortality from perforation occurring in the course of enteric fever will be markedly lessened. The medical text book of the future will not state, as does Loomis, "When perforation of the intestine occurs the case may be considered hopeless."

# THE TYPHOID FEVER EPIDEMIC AT SOUTH GLASTONBURY DURING THE FALL OF 1894.

CHAS. G. RANKIN, A.M., M.D., GLASTONBURY.

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From August 1st, 1894, to April 1st, 1895, there occurred in the town of Glastonbury forty cases of typhoid fever; possibly more that were not reported to the authorities.

These cases were scattered from one extreme of the town to the other. Of these the greater number were reported during the month of December, 1894. It is, however, with a part of these only that this paper has to deal.

On August twentieth my attention was called to a case of typhoid fever at Hopewell, a manufacturing village one and one half miles east of the village of South Glastonbury. Hopewell is a village of three or four hundred inhabitants, situated upon either side of Roaring Brook. In the center of the village is a woolen mill, close by the edge of the stream. From the mill yard, which contains beside the mill buildings, three tenement houses, the ground rises rapidly both upon the north and south. The soil is gravelly and rocky. The water-supply is from wells and springs.

On my visit to the village that morning, (August twentieth,) I found F. D., English, twenty years of age, male, at the beginning of the fifth week of typhoid fever. His boarding place was a single house, just outside the mill yard, and was in good sanitary condition. The water-supply was a spring, (which I shall call No. 1,) which was above suspicion. His parents had recently returned to England and he had since been something of a rover, and I was not surprised at not finding any local cause for his condition. After satisfying myself that all means for preventing the spread of the disease possible under the circumstances were being used I left.

August twenty-third I received word of the sickness of D., aged four, daughter of Superintendent Dixon. Typhoid fever was feared. The child had been away at the seaside for two weeks, and this fact led her attending physician, Dr. Rising, and myself into error in regard to the origin of the disease, which

soon developed into unmistakable typhoid. The house was situated upon a hillside at the north of the mill and seemed in a very good condition. Water-supply was from a well. Water from this well was subsequently examined by Prof. Smith, of the Yale Medical College, and pronounced free from contamination.

On the following day I received word that Miss S., aged twenty, and Miss M., aged sixteen, living in adjoining tenements in the mill yard, were sick, supposedly with typhoid fever. The sanitary conditions were bad. The sink drains emptied into shallow cess-pools. The water-supply was from a centrally located well, so situated as to receive more or less drainage from the cess-pools, privy vaults and gardens. The tenants said they used this water only for washing purposes, bringing all their drinking and cooking water from spring No. 1. On leaving the house, however, I found several small children drinking at the well. I immediately condemned it, removing the crank. Inquiry elicited the fact that a man had been sick with typhoid fever during the preceding March in one of the tenements, and, the ground being frozen, the discharges were thrown upon the garden in such a manner as to have easily contaminated this well.

[Mr. F. D. Glazier, proprietor of the mill, was away at this time. On his return he sent a sample of the water from this well, from spring No. 1, and from the Dixon well to Prof. Smith for analysis. Prof. Smith approved of the spring water and that from the Dixon well, but condemned the yard well. I would like to state here that Mr. Glazier did everything in his power to assist in fathoming the mystery of this epidemic.]

On the same date as these last cases, C. P., male, aged fifteen, was reported as having typhoid fever at his home in the eastern part of the town, having returned hither from the Hopewell boarding-house, also situated in the mill yard. His fever ran a very severe course, terminating favorably.

Soon after this a second child was taken sick in the family of Mr. Dixon. Mr. D. was next taken, to be quickly followed by Mrs. D., who died on the tenth day, of pericarditis. Soon after this the third child was taken with the disease. He was at once sent to the Hartford Hospital. Mr. Dixon died on the 6th of October, of perforation of the bowels, after having been on the gain for several days.

Meanwhile the disease had made its appearance in other places. Miss O. B., age twenty-four, was taken about September fifteenth. The house and its surroundings were in bad condition. Water-supply from a well. She had a very long illness, pneumonia complicating the typhoid fever. Death finally resulted from a pre-existing tuberculosis. During her sickness a niece, living in the same house, ten years of age, contracted the fever, which ran a mild course of about two weeks' duration.

On September third word was received that William Reid was sick with typhoid fever. The house was situated near that occupied by Mr. Dixon, still higher on the hillside. The well being dry, the family obtained water from a spring (No. 2,) near the mill, and from which drinking water for the mill was obtained. I found the premises in a very unsanitary condition, there being a large pool of sink sewerage enclosed beneath the kitchen floor, which filled the whole house with the gas. This, I learned, had been accumulating for at least four years. This case was very severe from the start, and death ensued at about the end of the fourth week.

About a week later a sister who had returned home from a neighboring town to nurse her brother was taken down and died of the fever after an illness of about four weeks. Her death was quickly followed by the sickness of two other sisters who had aided in nursing her—ages twenty-one and seventeen.

A few days later another brother and three sisters were taken. These were sent to the hospital—three being taken one day, two the next, and one the next, leaving no one in the house but the father and mother.

We now had no typhoid fever left at home and began to feel easier, but on the following week four were taken sick in the family living in the tenement adjoining the Reids—a girl and three boys. The girl was taken to the hospital and the boys whose cases were mild were cared for at home.

A few weeks later the last case occurred—a child of four years—making in all twenty-four cases within a radius of one-fourth of a mile, with six deaths, counting one that died at the hospital.

The sixteen remaining cases that occurred during the period named (August to April) were isolated, and no entirely satisfactory cause could be found. Of these five resulted fatally.

In regard to the Hopewell series, I am unable to "make out a clear case" with each one but will endeavor to satisfactorily connect the majority with the contaminated well, near which the discharges from a typhoid case had been thrown the previous March. Upon analysis the water of this well showed surface contamination.

The families living in the yard and using the water for certain purposes admitted that they sometimes took a drink from this well. I think there can be no doubt that the Misses S. and M. and C. P., received their infection from this well.

The Dixon children, especially the little girl, were accustomed to play about the mill yard, and were known to have drunk from the well. The little girl was taken to the sea-shore because she was not well, and was not well there and took to her bed as soon as she returned home. She was nursed by her mother, and the other children were allowed to play on the bed with her. Her father and mother slept in the same room, probably without proper ventilation. It seems probable that the rest of the family were infected by the little girl.

Wm. Reid was waiting upon Miss S. and continued his visits upon her after she was taken sick. He spent considerable time there evenings, probably was not at all careful, might have kissed her frequently. He had also, as delivery clerk for the grocery, been in and out of the other houses in the village, where typhoid fever was present. He was a favorable subject, for he, with the rest of the family, had been living for years with that putrid cesspool under their kitchen.

His sister, a dressmaker, returning home took almost entire care of him and contracted the fever from him, and the rest of the family from her.

The next family was very intimate with the Reids and went back and forth many times a day and undoubtedly took their fever from them.

There remain yet three or four cases for which I have not accounted. I admit I was unable to do so. There are those who claim that every case has its preceding case and should be traced to its source. But it is not always possible to do so.

# THE TREATMENT OF TYPHOID FEVER AT THE HARTFORD HOSPITAL.

BY JOSEPH B. HALL, M.D., INTERN.

From the first of July, 1894, to the first of January, 1895, eighty-two cases of typhoid fever were treated at the Hartford hospital, and of these cases seventy-eight recovered.

Throughout the season the severity of the fever was marked, the temperature in the majority of the cases runniug as high as 104° or above, and in one case which afterward recovered, reaching 107.2 in the first week.

During the last three months abdomiual tympany, diarrhea and nervous phenomena were persistent symptoms of a large number of the cases. It is well to remember that cases enter the hospital at all periods in the course of the disease and the severity of the fever which came under our observation may possibly be explained iu this way.

The physician attending a case among the lower classes strives agaiust prejudice and iguorance: he has no conveniences for regular treatment or even nourishment and is usually unable to iuduce the family to send the patient to the hospital until his condition becomes so critical that they are obliged to conseut. In this way it may be that we received many of the most severe cases.

On entering the hospital the patients are placed upon a diet of milk, about three ouuces with lime water being given every two hours and iucreased or diminished according to the ability of the patient to digest it. The amount given in twenty-four hours varied from twenty-eight to sixty ounces, and care was taken not to admiuister more than could be easily digested.

Milk seemed to fulfill all requirements better than any other article of food.

The appearauce of symptoms of indigestion, the presence of oil globules and curds iu the stools or the appearance of abdominal tympauy were all considered iudications for both peptonizing the milk and reducing the quantity. This change was usu-

ally sufficient and peptonized milk constituted the diet in a large number of our severe cases from beginning to end. If the above mentioned symptoms persisted, however, and did not subside after the reduction in the amount of peptonized milk, the milk was stopped and beef-juice substituted. Meat broths and solutions of egg albumen were of service under these circumstances. Beef-juice, however, proved to be in every way our best substitute for milk. Water was of course, given freely throughout.

Although stimulants were not ordered as a matter of routine and were avoided as long as possible in the mild cases, they were indicated and used in every one of our cases at some period in the course of the disease and in by far the larger number they were given throughout.

Whiskey was usually employed, the amount varying from two to twelve ounces during the twenty-four hours.

An internal antiseptic was given in all cases from the beginning to the end unless the stomach became irritable. In twelve cases the bichloride of mercury was used and these cases recovered. In all the rest of the cases salol was used, three grains being given every six hours in capsules. This seemed to be the more satisfactory. It should never be used however in case of extreme depression or gastric irritability, nor should it be used in large doses. Much dependence was placed upon turpentine and other internal antiseptics were stopped and turpentine substituted whenever its use was indicated by abdominal tympany.

The condition in which turpentine is most strongly indicated and in which its beneficial action is most frequently observed is commencing abdominal tympany either without or with very little diarrhea. In many instances during the season the exhibition of turpentine was followed by a steady improvement in these symptoms that could only be attributed to its action. It was given in the form of an emulsion made up with acacia, ten minims to the dram, one dram being given every four hours.

Undoubtedly the greatest problem that arises in the treatment of typhoid fever is the reduction of temperature and the object of this paper is to lay before the society as concisely as possible the system of bathing in use at the Hartford hospital.

Early in the season, simple sponging, sponging with alcohol and water and fanning, which methods were then in use, were found to be totally inadequate to cope with the high and resistant temperatures with which we were contending. While the method of simple sponging so frequently practiced is sufficient in many of the mild cases, we have always found that in order to have any effect upon a persistently high temperature the water must be used at a low temperature on account of the small amount that it is possible to use.

This is uncomfortable, and I have seen it give rise to quite a severe shock. Also, if the patient's temperature is taken carefully about twenty minutes after sponging it is usually found that it has been reduced very little, if at all.

The object of our bath system is to remove the excessive heat by bringing the patient in contact with a large amount of warm water, rather than a small amount of cold, and at the same time to do this without moving the patient. The system was introduced about the first of August, 1894, and has been used with success ever since. On the day of its introduction there were two cases in the ward with temperatures that ran persistently above one hundred and four degrees and which we had been unable to reduce. A trial bath was given each of these and twenty minutes after, the reduction of temperature was found in each case to be over four degrees. In each case the pulse rate was reduced more than twenty beats to the minute. The patients seemed much more comfortable and quiet and did not object to the baths.

THE BATH SYSTEM

An ordinary blanket, a large rubber blanket, and a sheet are spread upon the floor, one over the other in the order named. These are then rolled up together, from the side, and unrolled under the patient in the same manner that a trained nurse changes the sheets upon a sick bed, causing very little disturbance to the patient, who then lies upon the sheet. Under the sheet is the rubber blanket, and under this the ordinary blanket. There is a folded sheet over the hips, a towel over the forehead and a sponge is kept in each axilla. The patients are bathed from a small tub holding about two pails of water. The nurse who does the bathing is assisted by another nurse or an orderly,

who by the addition of warm or cold water as is required, easily keeps the water in the tub at the temperature ordered. The bathing is done with a large sponge, which is not wrung out, but is kept full of water.

In the hospital the weight of a patient depresses the center of a bed about four inches below the level of the edges and as the bathing proceeds the water rises rapidly in the bed until nearly one half of the surface of the trunk is submerged. The beds when full hold from two to three pails of water and are kept nearly full throughout the bath.

Another thermometer is kept in the bed beside the patient. As soon as the bed is full of water the portion of the surface of the body that is not submerged, may be bathed from the water in the bed until the temperature of this water, as indicated by the thermometer, rises so high as to render its removal advisable. The water is then removed from the bed by means of a basin and the bathing continued from the tub.

The nurse, using the sponge full of water, sponges lightly and as rapidly as possible, first the arms, chest and abdomen, then the legs, alternating quickly from one to the other, the object being to keep the whole surface of the body practically covered with water and to allow no part of it to dry by evaporation.

If the bathing proceeded slowly and one portion of the surface of the body was allowed to become nearly dry while another portion was being bathed, the patient shivered and became cold and uncomfortable. Also, possibly on account of the discomfort rendered him, the reduction of temperature which followed was seldom satisfactory.

I think the larger part of us remember that when we were boys and "went in swimming," if we came out upon the bank, although the air was much warmer than the water, we became usually very cold and hastened to get under water again to get warm. For the reason that evaporation causes this sensation of extreme cold, it is avoided as much as possible in our baths by keeping the patient virtually under water. When the bath is finished the water is removed from the bed by means of a basin and a sponge, the rubber blanket and sheet are rolled out from under the patient and he is left in the dry blanket in which he is then enveloped. Another blanket is thrown over

him and he is left twenty minutes, when his temperature is taken and the amount of reduction recorded. The blanket is then removed in the same way and he is left in the bed which has not been disturbed or dampened.

From two to nine pails of water are used in a bath, according to the amount of difficulty which we have experienced in reducing the temperature.

In the same way the length of time of bathing varies from eight to twenty-five minutes and the temperature of the water used from ninety degrees to fifty-five degrees. Variations in these three particulars make many combinations possible and place a large range at the disposal of the physician. In fact, the success of the physician using this method depends upon the care with which he notes the effect of the baths upon the patient and his ability to vary and adjust the length of time of bathing and the temperature and amount of the water used so as to suit the peculiarities of the patient and at the same time obtain the amount of reduction of temperature which he desires. When the temperature ran as high as one hundred and three degrees, the amount of reduction which we desired and usually obtained, was about four degrees.

I have said that the object of this method of bathing is to conduct the excess of heat from the body by bringing the patient in contact with a large amount of warm water rather than a small amount of cold. For example: A patient whose temperature is one hundred and four degrees is being bathed with water at a temperature of eighty degrees. Now, although water at this temperature is warm and not especially uncomfortable, it is still twenty-four degrees below the temperature of the body and quite a large amount is used.

I have seen the temperature of the water in the bed rise seven degrees in five minutes' bathing, showing how rapidly and what an amount of heat is conducted from the body. The pulse rate was almost invariably diminished in proportion to the fall in temperature, the amount of reduction ranging from ten to fifty beats to the minute. The entire general condition of the pulse was also much improved.

The temperatures of the patients are taken every four hours, day and night, and the baths are given usually when the tem-

perature is found to be as high as one hundred and two and five tenths degrees, although this varies according to the height at which the temperature is running, the condition of the patient, and the severity of the bath which it has been found necessary to give.

After a bath the temperature rises again slowly to its former elevation, but in no case in which the rapidity of this rise was tested did it reach its former elevation before three hours had elapsed. On the contrary, there were periods in the course of nearly every case during which the alternate baths were omitted because during the four hours the temperature had not risen as high as one hundred and two and five tenths degrees. It will be seen from this that the temperatures were held at a reasonably low point. Throughout the season no patient came under observation whose temperature could not be reduced by this method of bathing, although in a number of cases a few trials were necessary before the baths could be so adjusted as to obtain this result.

In no instance have I noticed a perceptible shock follow one of these baths. The beneficial influence exerted upon delirium and apathy by this bathing was remarkable, and as nearly as I can recollect, only one of the cases that were delirious upon entering remained so for more than three days. This particular case ran so low a temperature that the baths were not given. In many instances the sensitive patients were bathed for the first two minutes with water at a temperature of ninety degrees, in order to accustom them to the bathing, the rest of the time being spent in bathing at the temperature ordered.

Patients with high temperatures and marked nervous phenomena often object strongly to the baths. In these cases we often commenced by bathing from three to five minutes only with water at a temperature of ninety degrees, making no attempt to reduce the temperature, but simply endeavoring to accustom the patient to the bathing, and in about two days, assisted by the increasing apathy of the patient, we were enabled to lengthen the time of bathing and lower the temperature of the water until the fever was held under control and to continue these baths throughout the attack.

In other cases of this nature in which the immediate reduc-

tion of a high temperature was thought to be necessary, it was found to be of advantage to give, for a short time, small hypodermics of morphine before each bath.

I noticed something, which possibly might be called a peculiar idiosyncracy of the temperature itself, which I think deserves mention. As an example of this, a patient's first bath was given for twenty minutes, with water at a temperature of seventy degrees. He did not object to the bath, did not shiver and said that the water was not too cold. His temperature was not reduced by the bath. The next bath was given at sixty-five degrees and the next one at sixty degrees, but neither were effectual. The following bath was then given at a temperature of eighty degrees, and twenty minutes after his temperature was found to be reduced four and a half degrees. Bearing in mind the fact that the first bath at seventy-six degrees gave rise to no sense of discomfort, it may seem peculiar that this should be ineffectual, while a bath at eighty degrees should reduce the temperature more than four degrees, yet this same thing occurred in a number of cases, and it became necessary for us to bear it constantly in mind when ordering the baths.

Zeiter's tubes, or ice coils, were given a thorough trial, and although they proved effectual in some of the milder cases, they were most decidedly of no value in cases with high and resistant temperatures. More than once we have reduced a temperature from four to five degrees with a bath, then immediately adjusted the coils and observed the temperature rise steadily to its former elevation.

Reducing the temperature by means of the "wet pack" was tried occasionally and differs from our method in this, that for the reduction of temperature by the wet pack dependence is placed upon evaporation, which is avoided as much as possible in our method. It certainly causes many of the patients great discomfort and the sensation of extreme cold experienced is liable to cause a shock. Also the physician can entertain no feeling of certainty as to the amount of reduction of temperature which the wet pack will produce, while with our method we can be reasonably sure from our experience with a patient about how much his temperature will be reduced by a bath, given for a certain length of time and at a certain temperature.

The rate of mortality in the New York Hospital before the introduction of the Brand system of tub bathing was seventeen per cent., but in the last two years, tub bathing being in vogue, this has been reduced to eight and one half per cent. I think that all of the advantages of the Brand system are afforded by our method of bathing. Our rate of mortality, which is four and three tenths per cent., certainly offers a favorable comparison. In one respect, however, our method offers a point of advantage not afforded by the Brand system, in the fact that it is not necessary to move the patient, an advantage which can hardly be overestimated and is of great value in serious protracted cases, in which frequent bathing is necessary, and in which there is danger of ultimate death from exhaustion: also in cases with marked abdominal symptoms in which there is thought to be danger of hemorrhage.

A second point in favor of our system is that it is of practical use to the physician in private practice, as it is only necessary to so arrange a bed that the weight of the patient will depress the center below the level of the edges. It has been used with success in private families in Hartford, where the introduction of the Brand system was practically impossible.

I have not spoken of the symptomatic treatment of typhoid fever on account of lack of space. We were conservative in this respect.

In the serious and complicated cases many seeming indications for interference present themselves. We have always believed, however, that the physician should administer no drug without careful consideration, as caution in this respect will do much in the way of avoiding gastric irritability and vomiting, which are at times such serious complications.

The temperatures of the severer cases throughout the latter half of the season were taken by rectum, as the temperatures taken by mouth and axilla were found to be unreliable in many cases.

It is necessary to mention a few cases in order to illustrate the effect of the bath.

Case I.—Stephen R. The patient was confined to his bed for three days before being admitted to the hospital. Three hours after admission his temperature was one hundred and four degrees. He was bathed for twenty minutes with water at a tem-

perature of seventy degrees, four pails of water being used, and twenty minutes after his temperature was taken and found to be ninety-six degrees, a reduction of eight degrees. The pulse rate was reduced fifteen beats to the minute. There was no shock nor did the patient shiver or object to the bathing. The water was used at a higher temperature in the ensuing baths, such extreme fall in temperature avoided and the fever easily held under control throughout. This instance, together with the following case, will serve to illustrate the efficiency of mild baths in certain cases.

Case II.—Rose P. The patient was admitted at about the middle of the second week of the attack. She was delirious and her abdomen was very tympanitic. Her temperature on admission was one hundred and five and five tenths degrees and throughout ran steadily above one hundred and four degrees, falling only after the baths. The pulse rate ran as high as one hundred and sixty and the respirations often ran as high as forty to the minute. Each bath, given for eight minutes only and at a temperature of eighty-five degrees, reduced the temperature from four to six degrees. The pulse rate was often reduced fifty beats to the minute. The respirations always became much less frequent after the baths, in one instance being reduced from forty to eighteen to the minute. After her temperature had become normal, and remained normal for eleven days, she had a relapse in which the temperature also reached one hundred and five and five tenths degrees, but was controlled by the bathing. She finally recovered.

Case III.—Thomas D. Going to the other extreme, this case is mentioned, in order to show the necessity and the effect of more severe baths. The patient was admitted at about the end of the first week. His temperature was then running as high as one hundred and four and five tenths degrees and for three days rose steadily, without the slightest fall, until it reached one hundred and five and two tenths degrees. During this time the patient was entirely unconscious. There was marked abdominal tympany and all efforts at reducing the temperature were entirely unsuccessful. The necessity of heroic treatment being plainly manifest, he was given a bath with water at a temperature of fifty-five degrees and of twenty minutes' duration. His

temperature was reduced by the bath from one hundred and five and two tenths degrees to one hundred and one degrees, and the pulse rate from one hundred and forty to one hundred and twenty. Although his temperature had been so difficult to control, after it had been once reduced, it rose again so slowly that it was not necessary to bathe again until eight hours had elapsed, at which time his temperature was one hundred and four and six tenths degrees. A similar bath reduced it to ninety-nine and five tenths degrees. During the next twenty-four hours only two baths were required, both reducing the temperature satisfactorily. In three days the patient regained consciousness and by the use of warmer baths his temperature was controlled throughout the attack.

# PART II.

## THE USE OF DIPHTHERIA ANTITOXINE IN CONNECTICUT.

### A BRIEF HISTORY OF SERUMTHERAPY.

BY ARTHUR J. WOLFF, M.D., HARTFORD.

In presenting this history of serumtherapy, which is now interesting the whole medical world, it would be desirous to devote the time to a complete discussion of its development, but as that would make a very long paper, I can only briefly point out some of the most important of the later contributions to the new science, which is in reality the offspring of modern bacteriology.

It is very curious, however, to note that the applications of serotherapy prove the old saying that "there is nothing new under the sun," for, Dr. Spät, in an article published in the Münchener medicinische Wochenschrift late last year, points out a passage relating to "serotherapy" in Pliny. He also tells us that it is a well-known fact that by using gradually increasing doses of poisons, Mithridates, the King of Pontus, (B. C. 124 64), rendered himself immune to their effects. Experimenting upon himself, he is said to have discovered an universal antidote which became famous in that time under the name of "mithridatum."

"One ingredient of this antidote seems to have been the blood of the Pontic Duck, which the king added because that fowl lived upon poison. (Sanguinem antidotis miserere quonum venenum viverent. Pliny, Natural History, Lib. XXIV, S. 111, Ed. Harduin, p. 210)."

Furthermore, upon looking up the records on the matter, it will be found that Dr. Guiseppe Babola, of Santa Margherita di Montaganna, made experiments upon the preventive and curative inoculation of the diphtheritic poison over thirty years ago. This observer recorded in the Gazetta Medica Italiana in 1859,

that he inoculated two healthy girls with membrane that was taken from the throat of a sister seriously ill with the disease, the result being a very mild attack in each case. Babola again reported in 1863, and 1864, in the same journal, a further series of experiments, for which he claimed fairly successful results, especially as regards the prophylactic effect of the inoculation. His method was to make two or three punctures on the arm with the point of a lancet that had been dipped in diphtheria products removed from the throats of patients with the forceps. Babola compares his method with vaccination, and inoculation with syphilis, and endeavors to explain its mode of action.

Of late years, however, the treatment of disease, particularly tuberculosis, the cachexias of malaria, syphilis, anemia, by means of injections of serum from different animals, has been employed to such an extent, that Dr. Ed. Égasse gave to the science the term "serumtherapy"; this not only applies to the application of the treatment in diphtheria and tetanus, but to the use of the serum from the blood from patients convalescent with pneumonia, scarlet fever, and some of the other infectious diseases.

Within two or three years, Tommosoli proposed the method of hemo-therapeutics to the treatment of syphilis. This method consists in the intra-muscular injections of a serum obtained from the blood of lambs or calves, on the theory that as these animals are immune to the disease, their blood must contain some immunizing substance. Cottrell used the serum from dogs, and Fournier from the horse; Bonaduce and the originator both report very favorably upon the matter.

About the year 1890 Richet and Hericourt announced to the French Academy of Sciences that they had made certain discoveries regarding the serumtherapy of tuberculosis, their investigations being made upon rabbits. This led Bernheimer and Lepine to apply their researches to the human subject, the serum of the goat first, and later that from the dog being employed.

Dr. Baretta reported very favorably upon this in the British Medical Journal of Nov. 14, 1891, and stated that in two thirds of the cases in which it had been used, a real improvement more or less marked was observed. According to the first named authors, the dog serum was used because the dog is im-

mune against the tuberculous infection, and while following up these investigations Babes claimed to have obtained a powerful anti-tuberculous serum by treating dogs with increasing quantities of tuberculous cultures.

Still later, within a year, Viquerat experimented upon the serum of asses, prepared in the same manner as the diphtheritic antitoxin is produced, but, as yet, the results are far from satisfactory.

Tommasoli later reported wonderful results in the treatment of lupus with dog's serum, which other observers did not confirm, and within a few weeks Coley has used the serum of rabbits which have been treated with the toxins of erysipelas, in the endeavor to cure sarcomatous and carcinomatous growths, the results of which are yet involved in much doubt.

In the treatment of pneumonia with serum, much labor has been expended. About 1891, the anti-pneumonic serum was introduced by the Klemperers. Their investigations led them to declare that during the course of the disease, there was formed by the growth and life changes of the pneumococcus, a toxine, or poisonous albumen called "pneumotoxine"; this poison, when introduced into the bodies of animals, caused an elevation of temperature, and shortly the production of another albuminous material to which they gave the name of "anti-pneumotoxine," and which had the power of not only overcoming the poisonous effects of the pneumotoxine already formed, but of conferring immunity upon another susceptible animal. The Klemperers found that the serum taken from pneumonic patients after the crisis could cure pneumonia in rabbits, which are very susceptible to the pneumococcus; and, moreover, pneumotoxine and anti-pneumotoxine were present in human serum, as well as that taken from rabbits. In the treatment of the human being suffering with pneumonia, they used a serum at each injection of from 5 to 10 c. c., (3i$\frac{1}{2}$ to 3ii$\frac{1}{2}$), which was put into the gluteal region.

The general result of this treatment was the occurrence of a crisis on or before the second day after the use of the serum. This was confirmed by Lichtheimer, Jansson, and others, and Osler devotes quite a little attention to the researches of the Klemperers in his work. But, on the other hand, Lava, with

ten cases treated by this method with doubtful results, Bozzola reporting against it from an experience in five cases with one death, and the adverse conclusions of Foa and Scabia, it can be plainly seen that no definite opinion can at present be expressed on the value of serumtherapy in pneumonia, and this agrees well with the remark of Behring, that "as yet there is little comfort to be derived from the practical stand-point, from the Klemperer serumtreatment of pneumonia." The same may be said of cholera, typhus, streptococcus infection, and of Tizzoni's experiments in Italy, the latter seeking to produce an antitoxin serum from animals with which to cure hydrophobia in man.

Up to the present time, therefore, the most important and interesting applications of serumtherapy are confined to two diseases, diphtheria and tetanus.

About the year 1890, Behring and Kitasato, working in Koch's laboratory, found that by using injections of trichloride of iodine into animals they could be rendered refractory to the tetanus poison, and furthermore, the blood of such animals possessed in its serum curative properties. These investigations were soon after taken up by Tizzoni in Italy, by Roux and Vaillard in Paris, also by Wernicke, Schüz, and Knorr, with the same results as those reported by Behring and Kitasato.

Extended experimental researches in this direction have been carefully conducted; Behring has rendered large animals, like the horse and sheep, immune to the tetanic toxine, but, up to the present time, the disease has only been successfully cured by the serum, in such small animals as the mouse and the guinea-pig. Many cases of tetanus treated with the antitoxine have been reported; the first one being under the care of Gagliardi, in the Civil Hospital of Monimilla, Italy. This patient recovered after inoculation with the Tizzoni serum. Since that time Schwartz at Padua; Finnoti, from Nicoladoni's Clinic at Imsbrück; Casali; Taruffi, (the latter's case being studied and treated by Tizzoni himself), all reported very favorably upon the treatment in man, while nearly all the cases in which the serum was employed according to the method of Behring, ended fatally. It is very doubtful whether the reports from Italy and the Bologna school will stand the test of future investigation, particularly when it is remembered that Albertoni has announced that Tizzoni and

Centanni did not report certain of their cases that did not get well, also that many of the cases reported as cured were of that variety called chronic, which get well spontaneously. Serumtherapy as applied to tetanus also received a severe set-back in the reports of failures which came from Renon, Grancher, Polaillon, Auger and Letulle, while the complete monograph written on the subject by Roux and Vaillard, is very valuable as establishing the fact that the practitioners in Connecticut, so far as serumtherapy is concerned, may treat tetanus without regret at not being enabled to obtain the tetanus antitoxine, for they say that when once the disease is well developed, treatment with or without the serum is of little avail. Out of seven cases, there were only two doubtful cures, but, they also say, that serum treatment in tetanus is of some value as a prophylactic, and might be of service in the beginning of the malady.

It is now five years since Behring and Kitasato announced their discoveries regarding the effects of the products of the Klebs-Loeffler bacillus which they had injected into guinea-pigs. The results of these investigations have given to the practical physician the most valuable remedy of the age; indeed, it is perhaps true that their discoveries will mark one of the most important mile-stones in the wonderful medical history of the nineteenth century. The events of which I have spoken, and the failures which I have been compelled to record, paved the way for this. One can easily follow, step by step, the development of this great discovery from the studies of Grawitz, Grohman, and Gamaleia, in 1884, on the influence of fresh serum to produce attenuation of the virus of symptomatic charbon; the gradual addition to the facts by Fodor, Nuttall, Buchner, Ogata, Iasuhara, Hankin, and others, to 1890, when Fraenkel and Brieger presented to the profession their researches on the tox-albumins of diphtheria, and following closely the methods of the latter, Wassermann and Proskauer, in 1891, separated from cultures of the Klebs-Loeffler bacillus two substances, one exceedingly poisonous, and the other harmless when injected into the guinea-pig.

Fodor discovered the fact that the serum of the blood, and a few other fluids of the body, possess the real power to destroy bacteria; Buchner demonstrated that the germicidal properties

resided solely in the serum. But to Behring belongs the credit of showing that the blood-serum of animals that have been rendered immune to the toxine of diphtheria has the power of antagonizing and destroying the effects of the toxine in other animals; in other words, possesses curative properties. Following him may be mentioned the studies of Jammar, Tsuboi, Emmerisch, Gatti, Aronson, Buchner, and others. It has been pretty well established by Buchner and Behring that the active principles of serum, or the destroying properties of serum, probably reside in what Hankin calls "defensive proteids." These defensive proteids seem to be stimulated in their formation by the methods employed to render the animal immune to the diphtheritic germ, and while many points still remain to be cleared up in the matter, the striking effects of the toxine to kill, and the antitoxine to protect the guinea-pig, cannot fail to profoundly impress us when we come to actually observe their action.

Connected closely with this work are to be remembered the names of Behrens, Aronson, Roux, Yersin, Martin, Vaillard, Bertin, and in our own country those of Park, Biggs, Prudden, and others, whose interesting investigations are every day adding new facts to those presented to us by Behring; so that within a year or two the literature on the preparation and use of antitoxine will be very rich.

There are, however, so many questions of importance presenting themselves, that it may be many years ere all the practical demands of the new remedy can be utilized and understood by the profession. In the meantime, while we are awaiting some definite and fixed rules for its use, there is no doubt but that we have in the antitoxine a therapeutic agent, which will not only save many valuable lives, but will in the end rob the dread disease, diphtheria, of much of its terrors to the practitioner.

## ANTITOXIN IN DIPHTHERIA, IN CONNECTICUT.

The number of cases of diphtheria treated with antitoxin that have been reported to this Committee is seventy-one. In twenty-five of these cultures were made from the faucial secretions; in twenty-two the Klebs-Loeffler bacilli were found, and in the remaining three only streptococci or other cocci. The antitoxins used were Behring's, Aronson's, and also that made at the Pasteur Institute in New York.

Of these seventy-one cases treated with antitoxin, sixty-two recovered and nine died. Of the nine fatal cases, two were reported moribund at the time of the injection; one of these lived two hours, the other "a short time," the antitoxin being given at the request of the friends and against the judgment of the attending physician. The third was a laryngeal case, the dyspnea being so great as to require intubation. The fourth was a severe laryngeal case, the culture showing the Klebs-Loeffler bacilli. The fifth was also a case of diphtheritic croup, in which the Klebs-Loeffler bacilli were found. The injection was not made until the disease had lasted two days and a half; the child died eighteen hours after. The sixth was a laryngeal case, the antitoxin not being used till after the boy, aged thirteen, had been sick four days; he died fourteen hours after the injection. The seventh, a child four years old, died on the fourteenth day of the disease and the tenth after the first injection. The throat was perfectly clear four days before death, food was well taken; albumen, which before injection was fifty per cent. in bulk, was reduced to twenty per cent. or less. There was a history of kidney trouble prior to the attack of diphtheria. The eighth case was laryngeal; the stenosis of the larynx appears to have been relieved as the patient is reported to have died of septic pneumonia. The ninth case is one in which antitoxin was used without success; no further particulars were given except that an abscess developed at the place of injection. In none of the other fatal cases were there any unpleasant effects from the use of the antitoxin.

Of the sixty-two cases which recovered there were sixteen that were laryngeal. Bacteriological examinations were made in six of these sixteen cases. In three the Klebs-Loeffler bacilli were found, but in the other three only streptococci and staphylococci. These latter were, therefore, cases of membraneous croup.

In this group of sixty two recoveries the following symptoms attributable to the antitoxin were noted: In four cases urticaria, three of which were mild; in the other the eruption came on nine days after the last injection, with a slight rise in temperature, and disappeared in three days without treatment. In another case, a child aged ten, an eruption appeared two weeks after the antitoxin was given. The glands all over the body enlarged with muscular contractions, causing pain. In two cases very copious eruptions followed, in one erythematous, in the other somewhat resembling measles, very persistent, remaining two or three weeks. Another case had a chill on the third day after the injection, followed by violent fever, one hundred and five degrees, which lasted three or four days.

Four of these nine fatal cases ought to be excluded, or, at least, not set down as antitoxin failures. The first and second were in a dying condition when the serum was injected. In the sixth case the antitoxin was not given until after the patient had been sick four days; and in the seventh, there was pre-existing disease of the kidneys, and the antitoxin was not given until the fourth day of the disease.

It is a cardinal doctrine in the treatment of diphtheria with antitoxin, (as, indeed, with any other plan,) that it should be begun on the first or second day of the disease. If delayed until the third or fourth day the results are much less favorable; if not begun till the fifth day very little good is to be expected.

Among these seventy-one cases we find twenty-one that were reported to be laryngeal. There were, perhaps, more than twenty-one that were of this dangerous character, as our questions were not framed to elicit information on this point. Of these twenty-one cases with membrane in the larynx, sixteen were saved. This result is remarkable, and is alone sufficient to justify much that has been claimed for antitoxin by its warmest advocates.

We have already mentioned that in three of the laryngeal cases which recovered streptococci and staphylococci were found and that no Klebs-Loeffler bacilli were present. This is a very interesting fact and requires explanation from those who hold that antitoxin is a remedy against true diphtheria only.

The results of the use of antitoxin for immunizing those exposed to diphtheria have been reported to us by four physicians. Eleven children were given three preventive injections. Of these, ten escaped entirely, and one was taken with diphtheria six days after the injection. The only thing noticed among the ten who escaped was in a child aged eight months which became somewhat feverish and indisposed as the immediate result of the injection.

Turning to the results obtained in other places, we find that in the discussion of diphtheria antitoxin which took place in the Berlin Medical Society, on December 5th, 1894, Virchow stated that five hundred and thirty-three cases of diphtheria had been treated at the Kaiser and Kaiserin Friedrich Hospital since June, 1894. Of this number three hundred and three had been treated with antitoxin, with a mortality of thirteen and two tenths per cent. The remaining two hundred and thirty were treated by the old methods, without antitoxin, with a mortality of forty-seven and eight tenths per cent. Virchow then declared that "all theoretical considerations must give way to the brute force of these figures," and in view of these facts he held it to be the duty of every physician to use antitoxin in diphtheria.

In the Medical Record of New York for April 20th, 1895, we read that at the Congress of Internal Medicine lately held in Munich, Dr. O. Heubner gave statistics of three thousand cases from all parts of the world, that had been treated with antitoxin, with a mortality of twenty per cent. Among two hundred and seven cases treated at Charité Hospital, the mortality was only thirteen per cent., and among the one hundred and eighty-one pure cases, ten per cent.

"Baginsky reported that at the Kaiserin Hospital the mortality, which used to range about forty per cent., had been reduced to thirteen per cent. He also stated that among fifty-nine fam-

ilies one hundred and twenty-four children were inoculated for immunizing purposes, and that in no case did diphtheria occur."

"Ranke, of Munich, found that under serumtherapy the mortality rate fell from forty-two per cent. to eighteen and six tenths per cent. Several others gave reports of about the same character, and all expressed a belief in the therapeutical efficiency of the serum."

In New York the experience with the new remedy has also been very successful. Dr. Hermann M. Biggs, who, with Dr. William H. Park, has perhaps had more experience with antitoxin than any other person in New York, closes a paper on Diphtheria Antitoxin in the same number of the Medical Record from which the above extracts are taken, with these words:

"All that is required to convince any skeptical observer of the efficiency of the serum is that he may watch the results of one single, severe, uncomplicated case of diphtheria, when the remedy is administered on the second or the beginning of the third day. They are sometimes most extraordinary, and seem to me to approach the miraculous more nearly than anything which has previously come under my observation in medicine."

In closing this paper we beg to call attention to the fact that bacteriological examinations in cases of diphtheria were begun by the Board of Health of Hartford on December 1st, 1894, under the direction of Dr. Edward K. Root, the Medical Inspector, and Dr. Arthur J. Wolff, the Bacteriologist of the Board; the Health Board of Hartford being the first in the State, and perhaps the second in this country, to adopt these systematic bacteriological tests. Two drug-stores which were open night and day, were supplied with sterilized serum tubes so that physicians could obtain and use them at any time. Up to this date one hundred and fifty bacteriological tests have been made, including some secondary examinations made for permits to return to school, as no child who has had diphtheria is allowed to return to school until the Klebs-Loeffler bacilli are found to be absent from the throat by the Health Board.

On January 15th, 1895, steps were taken by the Health Board

of Hartford for the home production of antitoxin serum. A horse was carefully selected and the injection of diphtheria toxines begun after the best known methods. On March 20th his blood was tested and found to contain antitoxin. The toxine injections, however, were continued till May 19th, when the proper quantity of blood was drawn preparatory to its separation, test, and final use.

IRVING W. LYON,
FREDERICK H. WIGGIN,
CHARLES B. GRAVES.

Committee on Matters of Professional Interest in the State.

# PART III.

## INTERESTING CASES IN PRACTICE.

### A CASE OF TYPHOID FEVER WITH INTESTINAL HEMORRHAGE, HYPERPYREXIA, RELAPSE, RECOVERY.

RUSH W. KIMBALL, M.D., NORWICH, CONN.

October 9, 1894, was first called and found Mr. P——, aged twenty-seven, carpenter by trade, with pulse one hundred and five degrees, temperature one hundred and three and two tenths, a severe hemicrania, (relatives thought he had erysipelas,) tenderness and pain in abdomen, only slight tympanites and bowels constipated. Symptoms had been present four or five days and patient had felt sick and tired for a week.

On my second visit found stools of pea-soup order. Made diagnosis of typhoid fever. Ordered stools and change of bed and body linen disinfected at once. Patient put on a milk diet. October twenty-one, pulse markedly dichrotic and feeble. October twenty-eight, disease has uneventfully but steadily progressed during past week; characteristic eruption appearing on chest at tenth day. Soon after midnight of October twenty-eighth temperature took a sudden drop, extremities became cold and clammy and bathed with a free perspiration. Pulse also gradually fell until 6 A. M., October twenty-ninth, it was forty degrees and temperature ninety-seven degrees. About 5 A. M. patient had two stools, the first containing small amount blood, the second being much larger, with a large amount of blood, estimated by the nurse and myself at six fluid ounces. From 6 to 12 o'clock A M. patient comatose. Throughout the day the pulse and temperature gradually rose, but the respirations failed. In spite of almost continuous cold sponging the temperature rapidly rose, until at 9 P. M. it registered one hundred and seven

and two tenths degrees: pulse one hundred and forty, respiration eight. Ordinary antipyretics, like cold sponging, phenacetine in small doses, failing to relieve the hyperpyrexia, and a full tub bath not being available, patient was stripped and wrapped in sheets wrung out of ice-water, being kept continuously soaked for two hours, when the temperature registered one hundred and three degrees, and both pulse and respiration had slightly improved. Temperature soon rose again, but was easily controlled by the free use of ice-water. At this point respiration almost stopped and deglutition was accomplished tardily, when Dr. Almy was called in consultation. I had been using freely hypodermics of whiskey and ether without much result. Dr. Almy brought some musk and aromatic spirits of ammonia, which given by mouth temporarily improved the circulation. We decided upon strychnia hypodermically, grain $\frac{1}{15}$, repeated every half hour. Patient's condition improved. At my morning visit, at 10 A. M., of October thirtieth, found patient fairly comfortable with pulse one hundred and twenty-eight, temperature one hundred and two degrees, and respiration fourteen. Case continued to progress favorably, except for a second small hemorrhage on November second; subsequent pyrexia reaching only one hundred and four degrees; was easily controlled, until November seventh, when the temperature in the morning reached normal. Here on the twenty-fifth day of the disease a relapse set in, the temperature not reaching normal again for over four weeks; during this period the circulatory and nervous systems were most seriously affected. For three weeks the pulse was weak and fluttering, registering between one hundred and twenty to one hundred and sixty. It could be counted by the radial for over ten days, only by the stethoscope. A pint of brandy per diem was required to tide over two weeks of this period. Severe chills frequently occurred which quinine did not modify and the most profound prostration supervened.

On the thirty-fifth day of the disease the respiration rose to forty with absence of reflexes. He was unable to swallow, and comatose. Had to be catheterized for several days. Hypodermic medication.

On the fifty-sixth day of the disease the morning temperature

was normal, the tongue began to clear and the appetite to return. For several weeks afterward the temperatnre was snbnormal. Solid food was not allowed till morning and evening temperatures had remained at or below normal for ten days.

Convalescence was slow, but nneventful. Treatment in this case was with as little medication as possible, complications being met as they arose. Diet was essentially milk and lime water. Spring water was given abnndantly day and night at regular intervals. Hemorrhages were treated by absolute rest, ice over abdomen, pill plumbum et opium, restriction of diet for six to eight hours.

Brandy ℥vi to ℥xvi per diem was continued from ninth day. Strych. continuously after sixteenth day, gr. $\frac{1}{80}$ to $\frac{1}{60}$ every two hours. After thirty-eighth day quinine, gr. viii to xii per diem. Panapeptone used freely into convalescence. Constipation a fairly constant symptom, relieved by enemata given every three or four days. Hemogallol continued for over two months, beginning on forty-third day of disease.

Antipyretic treatment, only medication. Phenacetine in small doses on three occasions. Cold water sponge baths our dependence. The entire body was sponged in sections, taking from twenty to thirty minutes, repeated at intervals of two or three hours. This method kept the temperature at or near one hundred and three degrees or one hundred and two and five tenths degrees, except on two occasions; first, during the hyperpyrexia following the first hemorrhage as described before; second, during the fifth week of the disease, when sponging had to be repeated after every hour. The temperature was taken per rectum before and after sponging and a complete record kept of the temperature wave. Insomnia was not a prominent symptom, the cold sponging acting both as nerve sedative and hypnotic. Tympanites, troublesome only on several occasions, seemed to be relieved by hot turpentine stupes.

It may be interesting to note that the nurse, Mr. William H. Sweet, who so efficiently acted as night nurse throngh the critical periods of this case, on the forty-fifth day of the disease was himself taken with typhoid fever, removed to the Backus Hospital, passed through a sharp but brief illness, recovered and visited his former patient, who had not yet been out of doors.

# CASES OF TYPHOID FEVER.

BY JOHN F. DOWLING, M.D., THOMPSONVILLE.

The following cases may be of some interest to the profession on account of the duration, severity, and source of the typhoid poison.

Mrs. Annie H., aged twenty-four, born N. S., had been under the care of another physician for the space of eight days until she by her own request came under my care August 24th, 1894. Her former physician diagnosed her illness typhoid fever and I concurred in his diagnosis. I will not enter into details but will say, that her temperature ranged from 100° F. to 105.2° F. for a space of six weeks. The pulse from 110—140. She was for nearly all the time unable to retain food on the stomach, consequently she was fed per rectum. Cold baths were relied upon to reduce the temperature. Quinine was given in large doses the first few days without much effect. Calomel was also given. She ultimately made a good recovery. There were two other cases in the family, a brother and niece of Mrs. H. They were under the care of Dr. E. F. Parsons and I saw the young man in consultation with him. This young man was taken ill previous to his sister, Mrs. H., and continued about six weeks. The source of the poison was traced by Dr. Parsons and myself to contamination of the well-water on this farm by night-soil carried on the footwear of the farm help to the vicinity of the well when going for water and then washed from the surface by rains into the well. This water was used by all in the house for drinking purposes. The night-soil was gathered from different vaults in the town and deposited on the land of this farm. The water of this well was analyzed and found to be impure. Its use was discontinued.

On September 5th, 1894, I was called to see Mary M., aged eighteen years, born N. S., She had been feeling badly for

several days and had taken to the bed three days before I was called. Her temperature I found to be 103°, pulse 120, with profuse diarrhea, and later on all the typical symptoms of typhoid fever. Her temperature ranged from 101° to 105.8°, and did not touch the normal for the space of forty-nine days. During the third week pneumonia set in and ran an irregular course for about two and a half weeks. After the pneumonic symptoms disappeared the temperature and typhoid condition continued until the forty-ninth day, counting from the day of my first visit. Cold baths were used throughout with stimulants during the later weeks. Before the recovery of this patient her brother was taken ill with the fever, only in a milder form. I also had two cases in another family in the same yard at this time, and still another across the street, making five cases within fifty yards of one another. All these patients were using the purest hydrant in the state, that furnished by the Thompsonville Water Co., and had not been using well-water. I had to look to some other source for the poison.

In the rear of the houses occupied by four of the five patients I found an old drain or ditch partly covered over with rubbish and decayed organic and vegetable matter. It was also nearly filled with the foul drainings of two stables close by. There was a large heap of manure mixed with garbage deposited by several families in the vicinity, one family in particular depositing human excreta therein. There was no outlet to this open drain and with the decaying organic matter exposed to the sun during the past very dry autumn, I believe this to be the nidus of the typhoid poison responsible for this circumscribed epidemic. I at once had this pest-hole cleared out. Fortunately all these patients recovered.

During September, 1892, three brothers, Daniel K., Andrew K., and Thomas K., were taken ill with typhoid fever within one week. They lived on the bank of the Connecticut River and all used water from the same well. The father and mother of these boys (their ages ranged from fourteen to twenty-three years) also used the water but they claimed to have had the fever in Ireland. Andrew and Thomas recovered in three weeks. Daniel, twenty-three years, fever continued for five weeks. He slowly recovered. The source of the poison was traced to the well.

From inquiries made it was found that a member of a family that lived in part of this house had a few months previous a fever. The doctor called it, so the neighbors remarked, typho malarial fever. This family threw their slops on the surface near the well and the germs of the disease, no doubt it was typhoid fever, were washed into the drinking-water. This family moved out of town before my patients became ill and I could obtain. no information from them

The water of this well was subject to an analysis and found very impure.

# A CLINICAL REPORT OF SOME APPENDICITIS CASES.

BY WILLIAM I. PLATT, M.D., TORRINGTON, CONN.

(Read before the April Meeting of the Litchfield County Medical Association.)

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Great as has been the interest displayed among the surgical fraternity of late on the subject of appendicitis, the interest of the general practitioner in these cases is, and should be, even greater.

Not only do the majority of the cases come under his observation before being referred to the surgeon or specialist, but the disease occurs in such a variety of forms that there exists not a little diversity of opinion among different observers as to its proper management.

The statistics relating to the operation of appendectomy, in special and hospital practice, where the best sanitary conditions and strictest antiseptic precautions can be obtained, are hardly complete and satisfactory. The outcome of cases treated in private practice and under less favorable conditions have not been so carefully reported, and the following cases which have come under my observation since last October, may be of interest as throwing some light on this part of the subject.

Case I. Was called early in the morning of October seventeenth to see Mr. W. V. B., aged thirty-seven, coal merchant. Found him suffering severely with pain in the right iliac region. Was lying doubled up on the floor, pain constant but with severe exacerbations, face pale, pulse weak. Pain came on immediately after having a stool and had been growing steadily worse since. Had vomited freely. History of previous constipation.

Gave hypodermic of $\frac{1}{4}$ grain morphine, $\frac{1}{150}$ atropia, as near the location of the pain as possible.

Patient seen again with Dr. Pratt at 9 A. M. Was lying on the right side with right leg drawn up, slightly narcotized, but not free from pain; temperature ninety-nine degrees, pulse

eighty to ninety, somewhat irregular, especially after being moved in bed. Abdominal muscles tense on right side of abdomen and pressnre on McBurney point greatly increased patient's discomfort.

Ordered half a glass doses of Hunyadi water every two honrs nntil the bowels were thoroughly moved. Patient acquainted with nature of difficulty and the front room ordered to be prepared for an operation.

Eleven A. M., patient fairly comfortable; lies on the right side with leg flexed from preference. Temperature in axilla ninety-eight and six tenths degrees, in rectum one hundred and six tenths degrees, pulse variable and influenced by patient's being moved in bed. Dozes part of the time, but says the pain is still there.

At 4 P. M. of the next day patient seen with Drs. Pratt and MacLaren. Temperature normal, pulse seventy-eight, free from pain, able to extend the right leg without discomfort. Still some rigidity of muscles on right side of abdomen, but no great tenderness or appreciable induration. The symptoms continued to improve from this time and although the patient was kept in bed three or four days longer, he was able to resume business at the end of a week from the date of his first attack and has since had no return of symptoms.

CASE II. December seventh was asked by Dr. Hanchette to see Miss M. F., age twenty-six, who gave the following history. About a week before had worked hard all day and attended a dance in the evening. Had been suffering somewhat with what she called "stomachache" for two or three days previously. Six years ago, almost to a day, had had an attack of peritonitis which kept her in bed for a week or ten days. History of constipation since childhood. Patient was weak and anxious; temperature one hundred and two degrees, small, rapid pulse and hectic symptoms; complained of pain in the right side of the abdomen. Lay in bed with right leg drawn up. Examination revealed a tumor in the right iliac region, extending somewhat above the crest of the ilium. Tumor was hard and tender on pressure with no appreciable fluctuation.

At the request of the attending physician I gave the patient an anesthetic, while with an aspirating needle plunged through

the over lying tissues, we succeeded in reaching an abscess cavity and drew off a pint of thick pus of a marked fecal odor.

One week later, December fourteenth, the patient's symptoms continuing much the same, I was asked by the attending physician to make an incision with a view to evacuating the pus. An incision over the most prominent part of the tumor brought me down upon the cecum, which was empty, stretched over the tumor and immediately adherent thereto.

The appendix could not be felt, but was presumed to be in the mass posterior to the gut. The abdominal cavity was now carefully walled off with iodoform gauze and the adhesions broken up with the fingers, until the abscess cavity was reached, giving exit to a large quantity of thick, dark colored pus, containing a quantity of fecal matter. As it was deemed unsafe to make a further search for the appendix for fear of infecting the general peritoneum, a drain was passed into the pus sacs, the walling-off gauze replaced by fresh gauze and the wound brought together with two sutures. The patient did perfectly well after the operation. All gauze except the drain was removed at the end of twenty-four hours. At the end of another twenty-four hours the abscess cavity was thoroughly irrigated and steps taken to secure permanent drainage. The irrigation was kept up until all signs of fecal material in the discharges had ceased, when the wound was allowed to granulate. I am informed that there still remains a fistulous opening of narrow caliber, two and a half inches in depth, which is gradually closing up. Patient's general health has become excellent. Says she never weighed as much in her life as now.

Case III. On December twenty-eighth, A. G., age twenty, operative in factory, called at my office, saying he had left the shop on account of pain located in the *left* side of abdomen, up under the ribs. Gave history of habitual constipation. Without making any examination I ordered a laxative and asked to hear from him the next day.

Two days later, on December thirty-first, was called in great hurry at 12 noon. Found him suffering great pain which he referred rather indefinitely to the umbilicus or to a point slightly below and to the *left*. Temperature ninety-nine degrees, pulse one hundred and sixteen, abdominal muscles rigid, pain

constant with paroxysmal exacerbations. Hypodermic of morphia $\frac{1}{4}$, atropia $\frac{1}{150}$, did not materially mitigate the pain in fifteen minutes, when the dose was repeated.

Examination revealed abdominal muscles tense, thighs flexed, pressure anywhere about the abdomen increased the patient's discomfort. The greatest point of tenderness was over the location of the appendix, although the patient had no pain referable to the right side of abdomen.

Consultation with Dr. Pratt at 4 P. M. Patient was free from pain, temperature one hundred and two and three fifths degrees, pulse one hundred and twenty-four. Dr. Pratt concurred in the diagnosis and advised an operation in the morning if urgent symptoms continued.

Ordered half glass doses of Hunyadi water every two hours until the bowels were thoroughly moved and whiskey if the pulse became weak. January first, 3 P. M., temperature in the axilla, ninety-nine degrees; in the rectum, one hundred and two and two tenths degrees; pulse, very weak and thin; abdomen somewhat tympanitic. With the assistance of Drs. Pratt and Hanchette, I operated as follows; The patient being etherized, an incision near the location of the appendix was made, with as careful antiseptic precautions as could be obtained under the circumstances. The appendix was found very much swollen and adherent to the omentum. A foreign body could be distinctly felt through its walls. On its under surface was a sloughing ulcer about one quarter inch in diameter, with a perforation in its center. In breaking up the adhesions a small quantity of pus was liberated.

The appendix was amputated about half inch from its junction with the cecum, tied with silk ligature and the stumps seared with Pacquelin cautery. Quite a quantity of omentum was tied off and removed in the same manner.

Previous to breaking up the adhesions the general abdominal cavity was separated from the wound by septic sponges, and after the removal of the appendix the vicinity of the same was irrigated first with Peroxide of Hydrogen (15 volume solution), followed by normal salt solution. The sponges were then removed and as much of the abdominal cavity as could be reached through the wound irrigated, first with mild Peroxide solution,

followed by normal salt solution. A drain of iodoform gauze was passed down to the stump of the appendix and two thirds of the wound closed with interrupted silk worm gut sutures. Heart stimulants were used freely during operation and the pulse was not perceptibly weaker at its close than at the beginning.

The patient made a slow but uninterrupted recovery. The sutured portion of the wound healed by first intention. Sutures were removed on the eighth day. There was a free pus discharge from the open portion of the wound, beginning on the fifth day and lasting about a week. The drainage was then discontinued and the wound allowed to granulate which it did rapidly. The appendix was found to contain a rounded bead-like concretion about $\frac{5}{8}$ inches in length by $\frac{1}{4}$ inch in diameter, which was without nucleus.

The preceding cases are of interest inasmuch as they present those cases the histories of which are utterly dissimilar, except in their relation to a diseased appendix.

In case I, the symptoms may be explained by supposing that an intestinal concretion or plug of hardened mucus, having found its way into the appendix was again expelled or remaining, failed to set up a sufficient amount of inflammatory action to endanger the integrity of its structure. So far as I am concerned I am not a believer in the theory of non-communication between the appendix and cecum. I have investigated the subject carefully in quite a number of cases and have never yet found an appendix completely impervious.

In case II, we may suppose that an attack of appendicitis six years previously of sufficient severity to cause a localized peritonitis had remained quiescent until the exciting cause of excessive exertion set up a rapid suppurative action in already diseased tissues, resulting in a more or less complete sloughing of the appendix. I think this patient may congratulate herself that she has gotten rid of her appendix as completely as if it had been amputated—although less pleasantly and safely.

In case III, we have an illustration of what may be expected when the ulcerative action in the appendix is so rapid as to give nature no time to shut off the general peritoneal cavity by adhesive inflammation, a case which would have undoubtedly once

pursued a rapidly fatal course without immediate and radical operation.

By examining the appendix of this patient and comparing it with the healthy appendix in the same jar you will, I think, agree with me that the patient had had previous attacks. In fact unless I am much mistaken that appendix is an old and hardened appendix—nevertheless the patient denies any such history. If therefore appearances are to be trusted we may have a diseased appendix without marked symptoms, which I believe to be perfectly true.

There is another fact and not pertinent to these cases that each was so typical of the variety of the disease to which it belongs that there is small room for disagreement among us as to the proper place of treatment indicated in each case.

The following cases however, which with one exception and that seen only in consultation, complete the list of cases occurring in my practice during the last six months, are of a somewhat different character, and the question of their surgical or non-surgical treatment is not so easily decided.

Case IV. January 16th, 1895, was called to see Mrs. W. H. W., aged twenty-one. Found her suffering from severe paroxysmal pain in right iliac region, great tenderness at classical point, temperature $101\frac{3}{5}^{\circ}$, pulse eighty. Had vomited once. History of constipation from childhood, also of similar attack four weeks ago. Gave hypodermics of morphia and atropia which made the patient extremely comfortable—ordered Hunyadi water every two hours until bowels were thoroughly moved and then every morning before breakfast. Patient made a rapid recovery, but had an almost identical attack on March 16th, except that at this time there was slight appreciable induration over the location of the appendix.

It is perhaps a coincidence that this patient had faithfully carried out my directions regarding Hunyadi water until three or four days prior to last attack.

Case V. Miss M. J., age twenty, home on vacation from boarding school. Was called February fifth and found her suffering from a moderately severe attack of La Grippe.

Two days later she developed symptoms of appendicitis, but

in such a modified form as to lean to the suspicion of previous attacks. On being questioned she gave history of La Grippe two years before, during which she had an attack of pain in the right side of the abdomen, and had had repeated mild attacks since. In fact, had come to speak of the affection as her "grip side." History of obstinate constipation since childhood.

Her present attack was characterized by weak, rapid pulse, nausea and vomiting, temperature varying from ninety-seven degrees to one hundred and one degrees, most of time subnormal, pain in right side of abdomen, with greatest point of tenderness, without, however, appreciable induration at classical point.

Higher up on the right side, about three inches to the right and slightly above the umbilicus, was to be felt a hard swelling of perhaps the size of an orange, extremely tender on pressure, and evidently maintaining close relations with the appendix, pressure over the latter giving rise to pain and discomfort higher up and vice versa.

The treatment of this case comprised a liquid diet, excluding milk, stimulants and tonics, rest in bed, hot applications to the abdomen and Hunyadi water at frequent intervals. So obstinate was the constipation in this case, that hardened scybalous masses of fecal material were voided two weeks after the adoption of a liquid diet. Under such plan of treatment the induration slowly subsided, giving rise to the impression, which was further confirmed by the feel of the tumor, that it was due in part to impacted feces. The slow further progress of the case was not of particular interest, except for the fact that ten weeks later she had a recurring attack of such an unmistakable nature as to clear up any obscurity in diagnosis. Since then she is apparently making rapid strides toward recovery.

Case VI. F. H., age 12, school girl. Was called in the morning of March thirty-first. Found her suffering from severe paroxysmal pain in the right iliac region, right leg drawn up, temperature one hundred and one degrees, pulse one hundred and ten, tenderness and rigidity of muscles over right side of abdomen, no appreciable induration. Patient gave history of constipation preceding attack. She was confined to bed about a week, to the house for perhaps another, since which time she has been again attending school. For some time after her ill-

ness she was unable to assume a perfectly erect position without some discomfort in right side of abdomen, but at present she is apparently as well as ever.

You cannot fail to have noticed in listening to the report of these cases one very suggestive symptom common to them all, viz: constipation; usually of long duration, nor is there room for reasonable doubt that constipation stands in a causative relation to most cases. By constipation I mean any condition which renders straining at stool necessary. It is certainly easy of comprehension that any condition which operates to increase the intra-intestinal pressure will have a tendency to dilate and render patent the caliber of the appendix. Given these conditions, it only needs to imagine the fecal concretion of suitable size, in the right place at the right time, to have the rationale of the whole affair explained. When you consider that constipation also tends to render the contents of the cecum less fluid, in other words, favors the production of just such a concretion as was found in the appendix of case number III, the causative relation can be no longer doubted. Once the entrance into the appendix effected, spasmodic contraction, constriction, strangulation, inflammation, ulceration, gangrene and sloughing occur, in part or in toto, and the mad career of the useless little appendix is in full blast.

Regarding the question of surgical or non-surgical treatment of such cases as do not in themselves imperatively demand an operation, I am inclined to think that once the tendency to recurring attacks is established the operation should be strongly advised. The operation done early, before pus formation or adhesions have rendered it more difficult and under such antiseptic precautions as can be easily obtained, ought to be practically without danger. Certainly there is no comparison between an operation undertaken under such favorable circumstances and the emergency operation. It is also necessary to remember that these patients are carrying about a small volcano liable to eruption at the most inconvenient times, and to necessitate the performance of a serious and difficult operation at a time when the best surgical attendance is not obtainable. These circumstances alone seem to me to argue strongly in favor of the surgical treatment of these cases.

## A CASE OF MULTIPLE NEURITIS.

J. W. WRIGHT, M.D.

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The only case of special interest I desire to report is a Multiple Neuritis, occurring in a child twenty-two months old.

This was a baby in perfect health, with both parents of excellent health and habits, and without previous illness of serious consequence. December 5th, '94, commenced with pain in the ball of left foot, which prevented her from walking, followed by pain in both lower extremities, with coldness, which increased gradually up to left leg and thigh, then in the right and caused paralysis of both extremities. The third week the cold extremities became warm and the child developed a slight pyrectic (one hundred to one hundred and six degrees) with perspiration about the head and extreme pain on movement. The pain extended to the upper extremities and trunk, but not so severely as in the lower extremities.

Until the middle of February the child was in extreme pain on movement and in moderate pain without. The suffering was so acute that at times life was almost despaired of, but since the gradual cessation of the pain voluntary movements were slowly regained and at the present time almost full control of all muscular power has returned.

The cause of this disorder could only be traced to the eruption of eye and stomach teeth which appeared at the beginning of the disease, and were attended with a gingivitis, not only of the teeth involved, but also the neighboring teeth, the gums being swollen and nearly covering the incisors, and very red and tender.

The first diagnosis was a poliomyelitis anterior subacute, but as the disease developed it became evident that the diagnosis was an error and the diagnosis made of Neuritis was made by Dr. G. M. Hammond, of New York, and concurred in by Dr. S. M. Garlick, of Bridgeport, also in consultation.

The rarity of this disease in childhood and also the cause, alone induces me to thus place the case on record, since I have yet to find anybody who has seen the disease in a child so young and especially from such an origin.

## ATTEMPTED SUICIDE.

G. W. BASSETT, M.D., SHARON.

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On August 10th, 1894, was called to attend Mrs. F., age about forty-three, mother of six children.

Her illness dated from about July 4th, when it was supposed that she became over-heated. She became confused and dizzy and had great apprehension of some impending evil and an unreasonable fear of someone entering the house at night. She was very melancholy and for this and the bad feeling in head she took a quantity of medicine sent her by a quack in N. Y. Becoming gradually more and more depressed in mind and weaker in body, until the day of my visit, when she was seen to lose strength very rapidly, her husband sent for me. I saw her first about 7 P. M. Found her in bed with a very weak, thready pulse beating one hundred and thirty, temperature one hundred and one and two-tenths degrees.

In answer to my questions she said she was not in pain, except a little in the right side. Her whole trouble she referred entirely to her head. Not being satisfied with her answers, which were as brief as possible and given with great reluctance, I proceeded to investigate the cause of her extreme weakness. In attempting to palpate the abdomen, my hand came in contact with something moist, which upon inspection proved to be a dirty cloth, saturated with blood. This naturally surprised me and, to my enquiry if she was "unwell," she answered "No." Becoming suspicious, I then turned down the bedclothes and found an ugly wound in the right hypogastric region (about three and one-half inches long and haggled at upper end) parallel to and about three inches above Poupart's ligament. In answer to my question she admitted that she had made it herself with a razor. It seems that about 10 A. M. she asked her twelve-year-old daughter to get her the razor to cut her corns. In a short time she handed it back to the little girl

and nothing more was thought about it. When given back, the razor was dry and free from blood. So that she had been nine hours lying in a dirty bed and using some old dirty rags to sop up the blood as it flowed, before the wound was discovered.

With the assistance of Drs. Knight and Wallin, I cleared away the clots and at the bottom of the wound discovered what appeared to be the omentum. Introducing the finger into the wound, it passed easily as far as it could reach in all directions, showing plainly that the peritoneal cavity was opened and probably contained some clots. At this time it was noticed that the pulse was failing so rapidly that we feared the patient would die on the table, so that her condition forbade further investigation in the peritoneal cavity.

Of course, under the circumstances, we all felt certain she would die of peritonitis, even if she revived from the shock, and although there might be no wound of the intestine, for it seemed impossible that she should escape infection from without. But, though not the least hope was entertained of her recovery, it was thought best to suture the wound. This was hastily done with silk, a pad of gauze saturated with carbolic solution placed over the wound, and a quantity of dry gauze and absorbent cotton held over this with a broad abdominal bandage; a one-quarter grain dose of morphia given and repeated, p. r. n. and brandy every three hours.

The patient was watched night and day for two weeks or more. On the morning after the injury the temperature had fallen to ninety-nine and two-tenths degrees, pulse ninety, and patient was comfortable after a fairly good night's rest. The evening temperature was one hundred and six-tenths degrees, pulse one hundred and twenty-one. After this the highest temperature was ninety-nine and seven-tenths degrees and the highest pulse rate one hundred and fifteen. By the twenty-fifth the pulse was eighty-four and the temperature had remained normal for some days. The respiration varied during all this time only between seventeen and twenty-two.

The question of nourishment soon became a serious one, for the patient, finding that the attempt with the razor had failed, determined to try another method. She refused all food, and

only after bringing a stomach-tube to her and showing her that in case of further refusal we should be obliged to resort to this unpleasant mode of feeding, did she finally consent to take her food in the usual way.

The wound healed throughout about half of its length by "first intention." The sutures were removed about the eighth day and by August twenty-fifth the healing was complete. Her strength was very slowly recovered and the melancholic symptoms gradually passed away so that by December she was doing her own work, even to the washing.

# COUNTY REPORT TO THE HARTFORD COUNTY MEDICAL ASSOCIATION, APRIL 17, 1895, ON LACTATION.

BY GIDEON C. SEGUR, M.D., COUNTY REPORTER.

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Few subjects in the entire range of medicine are of as great importance as lactation, embracing as it does the suckling of the infant child and thereby largely influencing its growth and development, in fact, its very life. In reporting the results of our inquiry I have aimed to give as concisely as possible the views of each in composite, to draw certain deductions therefrom, and finally, in an editorial capacity, to emphasize those points which appear to be of the greatest importance.

I. Routine treatment or care of the breasts.

a. Before labor:

Application of astringents (ten) and alcohol; massage, especially if nipples are retracted, (seven); avoidance of tight clothing, cleanliness, drawing out of nipples daily the last three months.

The comparative comfort experienced in nursing by primiparae whose breasts have been prepared during the latter months of pregnancy, by nightly applications of a slightly astringent lotion, (such as a saturated solution of boric acid in dilute alcohol containing one or two per cent. of tincture myrrh,) with rolling and stretching of the nipple during application, once appreciated is a strong inducement to adopt it as a routine measure.

b. After labor:

Cleanliness, using a solution of boric acid or borax after every nursing; support and protect the breasts with soft pads; see that the breasts are entirely emptied; use alcohol applications if cracking occurs, or tincture benzoin and in severe cases nitrate of silver.

By the use of pledgets of cotton saturated with a solution of boric acid in water, applied to the nipple immediately after nursing and cleansing, and covering this with a small piece of

rubber-tissue to keep it moist, the nipple may be kept soft and soreness or cracking prevented.

Extract of witch-hazel can be substituted upon the appearance of the least soreness. Such simple routine means instituted in the beginning may effect much.

II. Nursing.

a. How soon begun?

Immediately after birth; as soon as the mother has rested, (thirteen); in twenty-four hours; the second day.

As soon as mother and child are ready the placing of the child to the breast appears to be beneficial to both. The former nutritive connection being severed the new one is at once begun or an attempt made in that direction. The secretion in the mother's breast is undoubtedly better for the child, after its mouth and throat have been cleansed with cold water, than any decoction or mixture that the cunning hand of an officious "aunty" can devise. The effect upon the uterus is more natural than the administration of ergot.

b. How often repeated:

The intervals must vary somewhat, according to circumstances, (one) every two hours during the day, (nine) less frequently at night.

Although little if any nourishment is obtained from the breasts until about the third day, yet it seems advisable to gradually prepare both mother and child and so the forms of nursing can be repeated three or four times daily; more often would seem to irritate both parties until the secretion of the milk is established.

III. Regularity of nursing:

Regularity of nursing is strongly commended, depending somewhat as to the interval upon the condition of mother and child. It may be found advisable to begin with as short an interval as one and one-half hours, but every two hours for the early months, (three to four) gradually increasing the intervals until at six or eight months the child is nursed every three hours during the day and five to six hours at night.

Ten to twenty minutes should cover the time of nursing.

IV. Under what conditions would you advise against nursing?

Advise against nursing when the mother's health is poor, especially if tuberculous; in cases of contagious or infectious diseases; when the supply of milk is deficient or of poor quality, and the child does not thrive or the mother's health is injuriously affected.

V. When there is too much milk secreted:

What the child does not take should be drawn off, (this may be done between nursings or immediately after,) the diet should be regulated, the amount of liquids diminished, saline laxatives employed as derivatives; the breast may be strapped and nursing stopped; and such drugs as quinine and belladonna given. One recommends twins or borrowing another baby. This condition is not often met with.

VI. Where too little milk is secreted:

Attention should be given to hygienic measures and such tonics as will best promote the general condition. A liberal diet with an increased amount of liquid nourishment, milk, gruels, animal broths, malt, rum-punch, chocolate, etc., should be tried with out-door exercise, (at least plenty of fresh air,) warm applications to the breasts, massage, faradization, frequent nursing, and the use of quinine, strychnine and pilocarpine.

VII. The quality of the milk can probably best be determined:

By its effect upon the child, (seven); a lactometer would determine its specific gravity and if allowed to stand in a tapering glass the amount of fat (or cream) can be readily appreciated.

VIII. If of poor quality, means for improving it should be at once instituted:

By providing better or more suitable food, especially of nutritious liquid foods, milk, extract of malt and chocolate, increasing the fats; or frequent nursing may be tried; also massage and warm applications to the breasts, or faradization to stimulate increased activity of the glands.

Phosphate of lime and tonics should be exhibited and every effort made to improve the general condition, removing as far as possible all depressing influences and promoting a healthful tone of body and mind.

IX. It is doubtful if any drugs have a marked effect in increasing or promoting lactation, although castor-oil, pilocarpine

and nitroglycerine are so reported, and tonics may be said to indirectly act in the same manner.

More positive knowledge attends the action of certain drugs in diminishing the secretion of the milk; belladonna especially, (nine); while the iodides, (five); opium, (three); saline cathartics, camphor, ergot, digitalis and phenacetine are reported as having greater or less effect.

X. There are a great many drugs which affect the child when given to the mother, and medication of the child can often be accomplished in that way, but it is very uncertain and consequently cannot be advised.

Most prominent in the list are opium, neutral salts which loosen the bowels, and potassium salts which produce diuresis, senna, rhubarb, antimony, potassium iodide, corrosive sublimate and other mercurials, arsenic, zinc and lead, scammony, sulphur, castor-oil, ammonium salts, turpentine, copaiba, anise, dill, garlic, wormwood, jalap, and the vegetable acids; in fact, it is a mooted question as to what drugs are not excreted through the mother's milk rather than those that may be present.

Some, however, claim there should be no hesitation in giving any drug to the mother, having never seen any effect upon the child.

XI. What drugs should be avoided during lactation?

All drugs which would prove injurious if given directly to the child should not be administered to the mother, but especially opium, belladonna, acids, and drastic purgatives.

Any condition in the mother demanding medication should be met, however, watching the child for any untoward effect.

### MASTITIS.

XII. The second part of our inquiry was directed to mastitis, and many and various answers were received respecting its cause, prevention and treatment.

a. Causes:

Among the causes assigned as producing mastitis we find infection through sore or fissured nipples, or the sore nipples themselves, mentioned most prominently; then follow neglect in regular nursing, cold, high temperature, dilatation of milk veins, milk stasis, injuries, irritation, susceptibility, a poorly nourished condition, unsanitary surroundings, and sore mouth

of infant. Primarily the causes might be stated as mechanical injury, lack of proper support or rest, and uncleanliness.

b. Prophylaxis:

The prophylaxis consists in rigid cleanliness and protection and care of irritated or wounded surfaces; rest, (a longer interval between nursings): care of the mouth of the babe; the use of astringents to strengthen the nipples; if tender, the use of a nursing shield; the removal of all mik from the breasts if the child does not accomplish it, and regular nursing, while some advise massage, with or without oil or vaseline, upon the first appearance of pain, distension or hardening; it surely should not be used after an inflammatory condition is present.

The prophylaxis might be said to properly begin in the preparation of the breasts and nipples before labor.

c. Treatment:

While a few recommend massage, expression of the milk, poultices, (three,) or cold packs, (three,) the cessation of nursing, (two,) the administration of quinine, the salines, (three,) opium, phytolacca, the iodides, and local applications of belladonna, (three,) camphorated oil or ichthyol in the early stage, others would place more reliance upon cleanliness, rest, the support of the breasts, but especially firm bandaging, (seven,) which can be easily and readily done in the beginning by the use of adhesive straps of the proper length and width applied closely over the congested and hardened portion.

XIII. There is more variation in the reports concerning the proportion of patients who nurse their babies in full, in part, or not at all, than in the responses to any other question. From less than one-half of those reporting who give proportions, we have the following:

a. In full:

The proportion varies from forty per cent. to ninety-five per cent.

b. In part:

Five per cent. to forty per cent.; average, sixteen per cent.

c. Not at all:

Two per cent. to thirty-three per cent; average, sixteen per cent.

About two-thirds in full, one-sixth in part, and one-sixth not at all.

Many express themselves forcibly upon the fact that they insist upon breast feeding if possible.

This acknowledged evil of the falling off in breast feeding of infants might be greatly remedied by the medical adviser paying particular attention to the matter and giving his patients sound reasons why it should be done. One says: "Cannot tell accurately. Very few do not try. Occasionally, I find a woman who has no milk; one case I remember, although the breasts were well developed in size. Multiparae advanced in years are not so frequently good nurses. One-third of my cases are obliged to stop in the course of from three to six months. More than half can nurse their babies for twelve months or more."

XIV. Advantage of lactation.

a. To mother:

It is a natural, physiological process and as such to be encouraged; every advantage if mother is healthy; develops the lactic glands and has a beneficial effect upon the entire system; it favors involution of the uterus, (five); and prevents too early conception, nervous irritability and disease of the breasts; and *it is economy.*

Some claim there is no special advantage to the mother unless it be to enable her to nurse subsequent children; one, after a few weeks nothing special; another, none after three months.

b. To the child:

Only one thinks there is none in an intelligent family. Others enumerate the advantages to be, a greater per cent. thrive than on artificial feeding; they escape the many dangers incident to artificial feeding; if the mother's milk is good, (even if nursed only in part,) it favors digestion, nutrition, development, and thus serves as a preventive of disease.

It is the natural food of the child and nature's methods cannot be improved, (seven); it prevents possible tuberculosis of bovine origin.

So for the child's sake, unless there is some positive, good reason for not doing so, *insist* upon the *breast feeding* of every babe.

XV. Is artificial feeding increasing?

Thirty-three per cent. report artificial feeding as not increasing, while sixty-seven per cent. think that it is.

One attributes the increase to the enterprise of various artificial food manufacturers with their pictures of wonderful babies that are sent to all mothers, inciting them to rivalry in various ways.

REMARKS.

XVI. Lady Somerset says: "There has grown up in America an artificially imposed silence on all questions relating to maternity, until that holy thing has become a matter almost of shame."

Lactation is regarded by too many women with a sentiment which approximates to shame, and hence we suffer from the ills incidental to its neglect or want of proper attention.

A young woman whose breasts were not unusually developed in size and whose nipples were remarkably flat, after her first confinement suffered from excessive galactorrhea. In spite of the use of nipple shields of the most approved make, the nipples became very sore and continued so in spite of the use of approved local applications.

The milk flowed so freely as to keep her clothes constantly wet and the skin, from the line of the nipples to the umbilicus below, became so constantly excoriated as to prove exceedingly annoying to both physician and patient. In addition, one breast inflamed and suppurated and after nine months of constant torments, nursing was discontinued. The child did well.

After a second confinement the same afflictive experience was repeated, except that the other breast inflamed and suppurated and my efforts to give relief were terminated by weaning the child when it was five weeks old.

After a third confinement no effort was made to nurse the child and a vast amount of trouble was saved both the doctor and patient by drying the breasts at once as soon as the milk appeared. This was done by strappings and local applications of the extract of belladonna, and best of all, perhaps, by preventing all officious efforts to take the milk from the breasts.

"A patient while nursing an infant a few weeks old was seriously threatened with mastitis. The breasts were thoroughly bandaged; nursing and all efforts to empty the breasts through the nipples were imperatively interdicted for one week. At the

end of that time the threatening symptoms having disappeared, the child was replaced to the breasts.

He was able to obtain his usual rations as far as appeared and no further trouble was experienced."

Too many mothers believe they can raise their children on the bottle as well as by nursing. It is the duty of the attending physician to disabuse their minds of this belief and demand imperatively, providing the mother is healthy and her secretion of milk sufficient, to nurse her babe. "The children of the present are the hope of the nation in the future."

More good common sense must be used in these conditions than is usually allotted to mothers.

"Physical, moral, mental and financial conditions or surroundings have to be taken into consideration.

In cases of too little milk, (which are very common,) think that frequent nursing is of great help, i. e. if the child must be fed artificially, it should be nursed each time immediately before feeding."

"Artificial feeding is increased, much being due to physician not insisting on mothers puttiug the child to the breast at once, mothers being (many of them,) only too willing to accept the physician's word and feed the child on a bottle. Many do not wish to and will not, and a very small proportion are unable."

"Upon the advice of some old woman, change and give the baby the bottle. This is a fruitful cause of disease and death among infants."

"One undertaker remarked in my hearing, that for the last one and one-half years, every baby whose funeral he had attended had been a bottle-fed baby case."

"In country practice, women of middle and lower classes are generally found to nurse their children."

"Undeveloped nipples and breasts bar out a small percentage of cases. A few claim that the secretion and flow of milk habitually stop after a few weeks and resort must be made to artificial feeding."

"The dangers from nursing diseased and physically degenerate mothers, are becoming more apparent, calling for some substitute for the milk of the mother. Many of these now in the market are partial successes." "Not more than from four to six cases of mastitis in ten years."

"In unclean and ignorant families, I am anxious that the baby nurse, when the baby will be properly fed."

"I have no choice between nursing and artificial feeding; in many cases, for many reasons, prefer the latter."

"Do not insist upon nursing as in my earlier professional life."

XVII. Interesting or Unusual Cases:

"A lady in health was ordered beer and small doses of whiskey, eggs and milk to increase the secretion of milk. Two children, nursed while using those means, are feebl-eminded and one has convulsions.

A third child nursed without any drugs; the mother is healthy and vigorous.

My attention has been called to four distinct cases in this city where the mother used wine, beer and so-called tonics with spirits as a basis, with most disastrous effects on the offspring."

"Used laudanum and chlorate of potassium, about 3j of the former and a teaspoonful of the latter to a tumblerful of water as a lotion in a severe case of hemorrhoids after labor with success, using pulvis glyc. comp. to keep the bowels free."

"All are interesting when you have a sensible woman, healthy baby and everything moving on."

"Case I. Mrs. W., third child. Confinement normal. With other children had had severe mastitis; both breasts inflamed and finally suppuration.

With second baby was very ill indeed from the inflammation of breast. At first absolutely refused to nurse the third child for fear of a repetition. I finally obtained her consent to treat her nipples, and did so and avoided all trouble.

I kept tannin, glycerine and small cold compresses on the nipples and supported the breasts with a Murphy bandage. The child's mouth was washed with cold water before and after nursing.

After two weeks of this treatment, both breasts were perfectly well and gave no trouble."

"A case where one breast has been lanced frequently for abscess, (many years since). The scarred side (about one-third,) of this breast is much cicatrized and very hard in the parenchyma of the gland. The rest of the breast secretes milk, but it is questionable whether the hard part preserves its function."

# MEDICAL PAPERS.

# * SIMPLE MENINGITIS.

M. MAILHOUSE, PH.B., M.D., NEW HAVEN.

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*Mr. President, and Physicians of New Haven County:*

In preparing these pages I have elaborated my own experiences and observations by the writings and statements of many well-known authors. Among these I have selected at times whole sentences and more even, in order to explain best what I have to say, and for this purpose have made use in particular of the works of J. Lewis Smith, Flint, Hammond, Niemeyer, Gerhardt, Watson, Da Costa, Gray in Keating's Cyclopedia, and Minot in Pepper's System of Medicine.

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Simple meningitis is so called in order to distinguish it from tubercular meningitis. It is also called fibropurulent or purulent meningitis; also leptomeningitis, from leptos, meaning thin, light, an inflammation of the thin membranes; also acute non-tubercular hydrocephalus, when considerable ventricular effusion in the simple meningitis occurring in children from one to five years of age; this occurs mostly in the meningitis complicating the eruptive fevers, etc.

Simple meningitis is rather rare as an idiopathic affection. It is an inflammation of the pia mater and arachnoid. One of these cannot be inflamed without the other participating. With the meningitis is always more or less encephalitis. Inflammation of the dura mater is never included in the term meningitis.

Etiology. Extremely rare in healthy individuals or as an idiopathic affection, and though a little more frequent in the cachectic and those weakened by chronic disease, it is in many cases a secondary affection, accompanying as such, injuries and

* Read before the New Haven County Medical Association.

affections of the skull and dura, or affections of the cerebral substance. Blows or falls upon the head, with or without injury to the skull, are not unfamiliar causes of a purulent meningitis. These cerebral traumata are often overlooked by the family until closely questioned by the attendant.

Disease of adjacent structures is another familiar cause, notably caries of the petrous portion of the temporal bone following a suppurative otitis media and occurring especially in the strumous. Moreover, rarely the meningitis begins from inflammatory trouble arising in the nasal fossa and extending through the ethmoid to the cerebral envelopes. This is liable to happen after pertussis. The upper wall and apex of the orbital cavity are also media through which mischief may penetrate to the meninges.

Sunstroke is the cause of the meningitis in many cases, together with occupations which expose the head to intense and direct heat; also high atmospheric temperature without the action of the direct rays on the head. Some have attributed the disease to the action of very low temperatures on the head, taking cold, and getting wet.

Abuse of alcoholic stimulants is, without doubt, a frequent cause. Syphilis must not be overlooked in seeking for causes in individual cases. Depressing cares, business worry, grief and excessive intellectual exertion have acted as exciting causes in no small proportion of cases.

Infection by way of blood-vessels or lymphatics may occasion meningitis in the course of or subsequent to the following diseases: Croupous pneumonia, suppurative pleurisy, ulcerative endocarditis, pyemia, septicemia, acute articular rheumatism, gout, variola, scarlatina, dysentery, typhus fever, erysipelas of face or scalp, Bright's disease, peritonitis, chronic diarrhea, puerperal fever and carbuncle.

Gerhardt relates two cases of meningitis, the causation of which he attributed to chronic disease in the urinary tract following a gonorrhea.

Frequently recurring, active, cerebral congestion, however produced, as in severe and protracted bronchitis, may produce meningitis. The disease occurs more frequently in males than in females and chiefly between adolescence and the forty-fifth

year. It is most common in early manhood. Flint says there are very few cases of simple meningitis occurring in early infancy.

Pathological Anatomy. A serous membrane, the results of its inflammation are those affecting such structures, modified or changed according to its situation and other peculiarities of the tissues interested. The lesions are rarely general, but usually symmetrical over the hemispheres or base.

There is first redness from vascular injection and then as the inflammation really develops, serum, coagulated fibrin or lymph and pus are found. These products are found *beneath* and *not upon* the arachnoid, that is, they lie within the meshes of the pia mater.

The injection of the vessels extends even to the finest ramification, thus giving the membrane its color, which varies from crimson to light pink.

To determine inflammation, lymph or pus must be present. These are found by preference over the greater hemispheres, more particularly when the meningitis is due to the effects of the sun's rays.

If the meningitis is secondary to an otitis the inflammation is likely to be intense, confined to the meninges nearest the ear, often involving the brain substance itself with perhaps abscess formation. The fibrinous exudate is not usually thick and when found in the Sylvian fissure usually unites the anterior and middle lobes. The presence of pus is usually denoted by a greenish color. Exceptionally, the exudate is found more or less abundantly on the outer surface of the visceral arachnoid, as well as beneath it. Sometimes the outer surface of the arachnoid is abnormally dry. It is usually rough, and opaque from effusion of turbid serum into the subarachnoid spaces, where also often a yellow, mostly firm, exudate of pus-corpuscles and fibrin is found, that is between the gyri and about the large vessels. The arachnoid is more easily detached than normally. Sometimes the pus and fibrin form thick masses at the base of the brain and surround the nerves and medulla.

The perivascular spaces are filled with a grayish or yellowish fluid, composed of extravasated liquor sanguinis and white blood-corpuscles. The meshes between the two layers of the pia

are soon infiltrated with pus and the thickened membrane, when stripped from the brain to which it has become adherent, tears.

The extent of the lesion varies. It may be confined to a limited region of the hemispheres. It may occur at the base where tubercular meningitis is most common.

In young infants it may be quite diffuse and of little intensity, there being nothing more than slight cloudiness added to the hyperemia, the pus and blood only being visible by means of the microscope.

In infectious meningitis the lesions are more of the vertex, while from nasal or aural disease they are along the base or lateral aspects of the brain.

The ventricles may be, and often are, empty or contain a small or moderate quantity of turbid serum. In children the fluid is apt to be greatly increased. In case the inflammation has extended to the lateral ventricles, they are filled with a turbid fluid containing pus-cells and which is at times wholly purulent. The choroid plexuses sometimes are covered with pus.

If the ventricles are very much distended they, by the fluid compression, flatten the gyri against the cranium and the outer layer of cerebral substance will be found bloodless and edematous.

The cerebral sinuses are distended and frequently contain thrombi, due to the early stage of the inflammation, besides recent coagula.

The cortical substance of the cerebrum, though at times normal, is usually injected when its cut surface presents red points. At times it is the seat of inflammatory softening and sometimes is infiltrated with fibrinous exudation or pus.

In cases of meningitis lasting three or four weeks the deposit of pus may present an appearance like lard due to fatty degeneration of the pus-cells, some of which contain oil globules.

In cases of extensive serous effusion the foramen of Munro is apt to be enlarged and the portion of the brain separating the ventricles may be lacerated or softened. The degree of softening may be slight or so intense as to render the brain substance of the consistence of cream.

There are two morbid products sometimes present which may be mistaken for tubercle; one, pus which is semi-solid. In this, as the liquor puris becomes mostly absorbed after several days,

the pus-cells become shrivelled, irregular and aggregated, and thus resemble closely the cheesy transformation of tubercle-cells. At other times little masses of variable size, often not as large as a pin's head, appeared at the point of inflammation; these are firm, whitish in color or light yellow, and variable in number. They consist of a firm homogeneous substance, containing granular matter and cells closely resembling tubercle corpuscles. These bodies are plastic nuclei or plastic cells, often shrunken and collected in little bodies, which resemble crude tubercle. (J. Lewis Smith).

Microorganisms are also found in the exudate. They are various. Among them are the streptococcus pyogenes and also many resembling pneumococci.

The symptoms are to a large extent influenced by the areas affected. In the first stage the distinctive phenomena are due to excessive and disordered activity of the cerebral functions. In the second stage the brain suffers from compression. Owing to the unyielding bony case, a small amount of effusion and exudation is much more serious than a large amount in other situations. If strictly the upper surface of the brain is affected, delirium, incoherent ideas and irrational language are apt to be more prominent symptoms. In the base alone, contractions, spasms, convulsions and paralysis. Inflammation over the cortical centers of Fritsch and Hitzig (Hammond) will cause symptoms involving the parts controlled by such centers. Compression of the nerves at the base from the plastic lymph explains many symptoms, such as sighing respiration, eye abnormalities, etc.

Young infants sometimes die with all the symptoms of simple meningitis and at the autopsy we can only find moderate hyperemia of the pia, slight opacity or cloudiness of the pia at the base or elsewhere, with the presence of a few wandering white corpuscles, without fibrinous exudate, with no increase of liquid external to the brain, but much increase in the fluid of the lateral ventricles with hyperemia of the choroid plexus and a nearly natural appearance and consistence of the brain.

### SYMPTOMS.

The symptoms vary somewhat, according to the functions of the parts involved. The cortical layer is always involved unless the inflammation is of the most transient and limited kind.

The brain substance, cerebellum and medulla are subjected to pressure from afflux of blood, effusion of lymph and pus, and accumulation of serum in the ventricles. The cranial nerves are exposed to pressure from lymph deposit which may cause irritation or suppression of function or both.

Parts distant from the seat of lesion may be functionally disordered by reflex action.

The general system suffers from the effects of the high fever upon the blood and nutrition.

The symptoms are divided into two groups, according as they are observed before or after the occurrence of the serofibrinous exudation. Preceding these are sometimes placed so-called premonitory symptoms, due to determination of blood or active congestion, though where the latter ends and inflammation begins cannot be determined, unless possibly by the increase in intensity of all symptoms.

Headache is the most prominent initiatory symptom. When localized it is referred most frequently to the frontal region; next in frequency it affects the occipital region and after this the temporal region is preferred. The headache is usually constant, though generally intermitting somewhat. The pain in the head is usually very intense, obstinate and violent, and as a rule referred to the entire head, with a sense of heat, bursting, fullness or weight. It is the most characteristic symptom of this stage. The headache is increased by movement. With the headache the eyes appear red and suffused and the head feels abnormally hot to the palm. Frequently these symptoms are preceded by a chill, immediately followed by high temperature, usually one hundred and three to one hundred and four degrees, but which often mounts to one hundred and five to one hundred and six or even one hundred and seven degrees. A chill, together with the intense febrile symptoms, is quite characteristic of meningitis as distinguished from other brain trouble. In children, however, we are more apt to have convulsions at the outset of the period of invasion. Contraction of the eyebrows is a common symptom and when of a permanent character is considered by Gerhardt as very characteristic. In some cases, not rare, the first stage is very little pronounced or even entirely absent, coming on with slight headache, sleeplessness and heav-

iness and then gradually the more pronounced symptoms due to compression develop. This is the case most often when the meningitis is a consequence of ear disease, caries, etc., or following other cerebral disease. Sometimes in these cases the phenomena begin with repeated convulsions, followed by deep coma and general paralysis with contractures of single muscles, or headache, mental confusion and dizziness may occur and disappear with the external discharge of pus from the ear. The pulse is strong, full and accelerated. Such a pulse, which at first rises to one hundred and twenty to one hundred and forty, falls later to sixty or eighty, while the febrile and functional disturbances increase, indicates more certainly a meningitis.

Some rare cases begin with persistent localized pains in the abdomen for instance, and this may be the only marked symptom in the first stages. Da Costa speaks of two cases of this kind in which the pains occurred in the knees, were violent, intensified on motion and unrelieved by local means; there were neither swelling nor abnormal appearance of the joint.

Even after consciousness is dulled, patients often grasp at the head with light moans.

Delirium frequently occurs and is generally active and maniacal, sometimes hilarious.

The disease is sometimes mistaken for functional mania, owing to the prominence of the delirium.

At times it is so violent as to require restraint.

Active delirium and convulsions may persist until death.

In infants sometimes sopor and paralysis are almost the only symptoms.

When there is no delirium, as occasionally happens, the patient is very irritable and there is noticeable a change in character and disposition.

Transient dizziness may occur as one of the so-called premonitory symptoms.

In children sometimes, we notice the sudden appearance and disappearance of spots, patches or streaks of active congestion on the face, forehead and ears. A red spot or streak is also produced if the finger is pressed on the surface and drawn forcibly across; this continues a few minutes and then gradually disappears. (Trosseau considers this diagnostic).

The senses of sight and hearing are morbidly acute. Sight and sounds occasion distress and increase the cerebral excitement. The eyebrows are corrugated to keep out the light. The skin in general is hyperesthetic, especially of the legs. The face is flushed and the cartoids and temporals pulsate strongly. Added to these may be tinnitus, seeing flashes of light, restlessness usually great, grinding of teeth, and muscular twitchings. Vomiting occurs in the first stage and is often a prominent symptom; it is rarely absent, especially in children. It occurs without nausea and the ejection is sudden. It grows less as the patient becomes drowsy. In children when the meningitis is secondary, it is most frequently ushered in by vomiting and delirium.

The abdomen is retracted and presents a hollow or sunken appearance, due to the atonic state of the intestines. Owing to the same cause constipation is the rule.

The urine is scanty.

The eye symptoms are among the first and offer valuable aids in diagnosis. Often the first sign is an inequality of the pupils, which are at first contracted. Later the eyes often roll upward. Often there are irregular movements of the eyeballs. Toward death the eyes are bleared. There is a collection of puriform secretion at the canthi. Tears are seldom seen, however great be the suffering.

Optic neuritis when present is a valuable symptom, but it is not generally observed until late. It is often absent.

Convulsions are rare in adults, but motility is disordered. The facial and other muscles, notably those of the forearm, twitch. The convulsions, when they do occur, may be either tonic or clonic, and each convulsive attack leaves greater drowsiness. Retraction of the head is generally observed. Opisthotonos sometimes occurs.

Trismus is rare.

Hemi or paraplegia may occur, but are infrequent.

Contractures of the limbs may take place.

There may be difficulty of swallowing from spasm of the pharynx, and irregularity in breathing from implication of the respiratory muscles.

Of all of the foregoing symptoms, delirium, hebetude or coma,

convulsions and muscular twitchings are general symptoms found in many cerebral affections and are not pathognomonic of suppurative meningitis.

The first stage may continue but a few hours and rarely lasts beyond two or three days. Between the first and second stages there is at times a short period of apparent improvement. A slowing of the pulse, or a stiffness of the neck from tonic contraction of the muscles, followed in many cases by an attack of convulsions, indicates the passing into the second stage or stage of oppression as it is sometimes called. The symptoms now denote and are due to pressure from the inflammatory products.

Somnolence replaces wakefulness. The pain in the head diminishes. The delirium and muscular agitation subside. There is less sensitiveness to light and sounds, and the patient becomes insensible to external irritation.

The pupils are now dilated, though in rare cases still contracted.

They respond less or not at all to light.

Strabismus often and loss of vision more rarely occurs. The pulse as before mentioned becomes slow and perhaps irregular; toward the close of life, frequent and feeble. The temperature however does not fall. The respiration becomes arythmic, intermittent and suspicious. The stupor which has increased remits a little at times and the patient appears more conscious. The eyelids drop. Paralysis, limited to the face and ocular muscles or extending over one side of the body, may appear.

The mouth may be drawn to one side. The contractures of the limbs subside and are replaced by paralyses. The sphincters become relaxed and incontinence ensues. Convulsions most terrible to behold sometimes precede a fatal coma. If the progress is unfavorable, coma now comes on which continues until death. The patient dies in coma or asphyxia from respiratory paralysis, but generally from enlargement of the lungs.

In rare cases recovery takes place though almost never after symptoms of compression have continued uninterruptedly for any considerable length of time. In adults recovery seldom takes place without leaving traces of permanent damage, such as general debility, paralysis of one or more limbs, deafness, mental weakness, epilepsy, etc. General paralysis of the insane

and other forms of mental disease are often the result of meningitis.

The diagnosis is difficult and often impossible in the early stages when congestion and inflammation present the same pathological conditions and symptoms.

The typical symptoms are:

Sudden and acute pain in the head, with hypersensitiveness to light and sounds. Contracted pupils, in the first stage, rapid pulse, vomiting followed by delirium, convulsions and coma.

If a person previously in good health is taken with these symptoms they strongly suggest meningitis.

The beginning of the eruptive and continued fevers is sometimes mistaken for meningitis. These can usually be determined by the attendant circumstances. A careful examination of the urine will enable us to exclude uremia.

Narcotic poisons give a history which aids in their diagnosis. In addition, the pupils in these cases are dilated instead of contracted, except in cases of poisoning by opium.

The symptoms of meningitis differ from those of active cerebral congestion only in degree and persistency. This of course refers to the period preceding exudation. For a positive diagnosis more or less of the symptoms belonging to the second stage are required. Congestion is usually brief in duration, while meningitis usually lasts one or two weeks, and in cases which recover is followed by more or less permanent after effects, such as paralysis, rigidity, mental defects, etc.

A traumatism, or insolation in a child when followed by meningitis produces the suppurative form.

In all cases of meningitis careful examination should be made of the ears, nostrils, heart and lungs and inquiries made as to recent pertussis, croupous pneumonia, purulent pleurisy, ulcerative endocarditis, pyemia, acute articular rheumatism, scarlatina, dysentery or typhus.

In typhoid fever the temperature range is a characteristic phenomenon. In typhoid the development of the fever is slow and we have also diarrhea, meteorism, rose spots, iliac tenderness; in typhoid also there is no morbid acuteness of the senses and the continued delirium is not accompanied by any of the phenomena of the second stage of meningitis. In typhoid also

vomiting is not so prominent a symptom, and the headache and febrile excitement are not of so high a grade. Diarrhea when present in typhoid also aids in diagnoses.

In children is it especially important to diagnose meningitis from remittent and the continued fevers and from the results of irritation of the digestive system. In the continued and eruptive fevers the history and eruptions furnish important aids. In meningitis we have an expression of countenance which denotes great suffering. The character of the delirium, so much more active in meningitis, the much more intense headache and the throbbing of the vessels of the neck and face, point to meningitis.

The physiognomy must be observed and every symptom noted.

In pneumonia and pericarditis the physical examination should make the diagnosis clear; in these the delirium is not attended with spasmodic movements or paralysis.

The sudden disappearance of a chronic eruption is also an aid in distinguishing meningitis from the fever, when taken in connection with the symptoms.

There is greater restlessness, fretfulness and intolerance of light in meningitis than in the fevers of childhood. The association of headache and vomiting or pain of a neuralgic character in some other part point toward meningitis.

In acute mania the premonitory symptoms last a long time before the outbreak; there are no spasms, the pupils are not contracted, the stomach is not irritable and there is no complaint of the head.

There is in functional mania an absence of the morbid acuteness of the senses, an absense of febrile movement, and a continuance of the mania without the symptoms of compression.

In partial or circumscibed encephalitis the headache is less severe, the delirium less marked and the convulsions and contractions weaker. The febrile excitement is much greater in meningitis and the whole disease is more pronounced.

Cerebral softening is slower in its progress and preceded by symptoms due to other conditions.

Delirium tremens furnishes a history and shows a greater tendency to insomnia. The general character of the delirium is different. In meningitis we have febrile excitement, headache, heat of skin, absence of clammy perspiration and increased

temperature. In delirium tremens the pulse is soft and yielding. In meningitis it is tense and hard. In the former the skin and tongue are moist, in the latter dry and feverish. In delirium tremens the delirium is accompanied with tremors, in meningitis the delirium is not accompanied with tremors, but there is headache.

The diagnosis of simple from tubercular meningitis is not always easy and, when the trouble is at the base, often impossible.

In tubercular meningitis the development is gradual and there are prodromic symptoms.

In simple meningitis the invasion is sudden and it is without prodromata.

In the former the disease halts and remits: in the latter the progress is steady.

In the tubercular form the delirium is quiet and alternates with stupor: in the simple form the delirium is active and often furious.

In the former the temperature is scarcely ever elevated over two degrees.

A greater elevation of temperature characterizes simple meningitis.

The duration of the first stage is much longer in the tubercular form.

The simple form has a comparatively brief duration, the whole course of the disease taking generally but little over a week.

A family history of tubercle, a hereditary tendency, or in some cases the coexistence of tuberculosis elsewhere in the body may serve as a basis for differential diagnosis, determining the tubercular form.

In simple meningitis of course a hereditary tendency is to be excluded.

In tubercular meningitis, ophthalmoscopy sometimes reveals granulations in the choroid. Convulsions occur late: it is more common in unhealthy individuals and is rare in adults.

In simple meningitis the headache is of much greater severity and the symptoms are much more acute and intense. In this form also we may trace a traumatic origin. Idiopathic simple meningitis is very rare. Meningitis from ear disease is distinguished by the history, and its beginning with local pain and often otorrhea.

Sporadic cases of cerebrospinal meningitis or unusually mild cases, or cases at the beginning of an epidemic, are the ones that are apt to prove difficult of diagnosis from simple meningitis.

The epidemic character of the former when pronounced makes the case more clear.

In cerebrospinal meningitis there is little or no febrile movement in the beginning, and the pulse at this time is often less frequent than in health. The symptoms, however, exhibit their maximum intensity on the first day. The presence of marked spinal symptoms, and the frequent presence of an eruption, together with the dissimilar origin and rapid progress of the disease, are characteristic of the epidemic form. The presence of other eruptions, such as herpes, petechiae, roseola, etc., ecchymoses and debility out of proportion to the evidences of local disease; that is, conditions characterizing the typhoid state, point toward cerebrospinal meningitis.

On the other hand, simple meningitis is almost never primary, complicating or following some other or previous malady, fevers, chronic blood diseases or trauma. It also, when it occurs at an age which the epidemic form most commonly attacks, is generally secondary to tubercle, caries, etc.

In meningitis there is a gradual and progressive increase of the symptoms.

Prognosis. The fatal cases greatly preponderate. It is one of the most fatal of the maladies of early life, especially if treatment is not commenced sufficiently early. Some cases may be cured in the first stage, but in these the diagnosis may often be questioned. As, however, some few are cured even in the second stage when there is no doubt of the diagnosis, it proves that recovery is possible in the early stages. However, in such cases, loss of sight or hearing, paralysis, and even idiocy, are apt to be left behind. Death most commonly occurs between the third or fourth and twentieth days. Some cases continue longer. On the other hand, some are rapidly fatal, the patient dying in thirty-six hours. As a rule the duration in fatal cases is eight or nine days. Remissions are not uncommon and very deceptive; unless continuous for three or four days they are not of any value as favorable indications.

Profound coma, notable disorder of respiration, difficulty of

deglutition, general immobility and anesthesia, feebleness and great frequency of pulse, etc., denote an unfavorable termination.

Strabismus, hemiplegia and convulsions may be present in cases which recover. (Flint).

Acute articular rheumatism renders the prognosis extremely unfavorable. A case of this kind in my own practice was the most terrible illness which I ever witnessed.

In complicated cases, such as those due to insolation, the prognosis is better.

Hiccough is an unfavorable event.

Death may be due chiefly to apnea or from asthenia and apnea combined.

The treatment of meningitis varies greatly, according to the cause. If disease of the ear or its appendages has caused the meningitis, the pus, if it can be reached, should be let out by operation. If the indications point that way the mastoid should be trephined. If there is caries in the nasal fossa, possibly causing the meningitis, the carious bone should be removed.

Whatever the cause the indications for treatment of the meningitis itself are to prevent or arrest the extent and degree of inflammatory action by lessening the determination of blood to the head, to modify the violence and shorten the duration of the inflammation when it has once started on its way, and lastly, to place the patient in the best condition to withstand the violence of the disease and recover from its effects.

For the first of these indications prompt action is required. The patient should be placed in a cool, well-ventilated room in a subdued light, well removed from all noises and sources of irritation. Absolute quiet of body and mind should be secured. The head should be moderately raised, shaved clean and an ice-bag applied. If the patient is a middle-aged man, strong, of full habit, with a pulse to correspond, and of high tension, general bloodletting of ten to twelves ounces is indicated. But in the large majority of cases the application of one or more leeches according to the age of the patient, behind the ears or to the inside of the nostrils, or wet cups to the temples or to the nape of the neck, is all that we dare employ in the way of bloodletting. In the latter poultices may be made use of to increase the flow of blood.

Active purgation by a full dose of calomel and jalap, followed by senna, oil or salines, is an essential of treatment. This should be repeated in a few hours if no effect is produced.

The diet in the early stages should be of the blandest character, and all food should be given cold.

Blisters, usually on the neck or between the shoulders, though used early by some, are considered by most authors to have their proper place when exudation has taken place and coma comes on.

Tincture of aconite root, on account of its sedative property, may be used to modify the violence of the inflammatory action early in the disease. For this purpose it may be given in doses of one to three drops, according to age, every two hours.

To calm excitement and diminish the intensity of the inflammation, bromide of potassium or sodium in doses of thirty grains three or four times a day, should be given. To calm excitement and pain and diminish convulsions, chloral may be used with it, or per rectum, if necessary. If the convulsions are frequently recurring the bromide may be given every fifteen minutes.

Iodide of potassium is employed by J. Lewis Smith and many others in doses of two grains every two hours in infants of six months to one year of age, with twice the dose of bromide. He uses it early in the disease, while some use it only later.

Ergot is considered invaluable by some in doses of five minims to a dram every three or four hours. Calomel in small and frequent doses, or mercurial inunctions, are highly esteemed by some authorities.

In the third stage drugs are considered useless, but food in small quantities and at regular intervals with stimulants if indicated, should be given earlier. Milk, gruel, broths and eggs should constitute the diet. If the patient cannot swallow, he should be fed per rectum. The bladder should be emptied by catheter if necessary.

# TUBERCULAR MENINGITIS.

STEPHEN J. MAHER, M.D., NEW HAVEN, CONN.

Tubercular Meningitis is the most fatal manifestation of the most powerful enemy of the human race, the tubercle bacillus. It is the most common form of miliary tuberculosis. It is an inflammation of the meninges of the brain and spinal cord, caused by an invasion of the smaller blood-vessels of these membranes, by tubercle bacilli which had been dormant or developing in some other part of the body. It is usually, especially in children, located in that part of the pia mater and arachnoid which covers the base of the brain, although even in children it may infrequently extend over the convexity of the brain. It may also descend into the membranes of the spinal cord, or it may be confined to these membranes. The pia mater covering, the fossa-sylvia, the interpeduncular spaces, and the optic chiasm are usually found post-mortem to be sown more or less thickly along the course of the small arteries with grey or yellow granulations about the size of millet seeds, miliary tubercles. An exudation of a sticky fluid is usually found dilating the lateral ventricles, sometimes to such a degree as to break down the adjacent brain substance. It varies greatly in quantity and bears no relation in amount to the number of tubercles. These tubercles are themselves evidence of the nature of the disease. If their evidence is doubted, they will yield to microscopic inspection, absolute proof, the tubercle bacillus. This malignant bit of the vegetable world is easily demonstrated. It is often found not only in the tubercles but also in the walls of the blood-vessels through the affected part of the membrane.

This army of tubercle bacilli encompassing the base of the brain of a dead child, is an ugly fact, as ugly as any that our end-of-the-century medicine has to face. How did the bacilli get inside of the child's skull? I have said that they were a secondary development, that they must have been hibernating in some other part of the little one's body, that is, in the lungs,

in the bones, or in the bronchial, or tracheal or mesenteric glands. This is the explanation adopted by practically all modern medical authorities, as applicable to the great majority of cases of tubercular meningitis. But as to the question, is tubercular meningitis ever a primary tubercular lesion, there is considerable diversity of opinion. Osler rather guardedly says in his Practice of Medicine, that "in a few instances, the disease seems to be primary in the meninges." P. Simon, of Nancy, last year went over this subject somewhat exhaustively in the Revue Mensuelle des Maladies de l'Enfance. He is strongly of opinion that save for a possible case in which injury to the ethmoidal foramina in the upper-air passages might give inspired bacilli present in the nasal secretions, immediate access to the interior of the cranium, tubercular meningitis is always a secondary development. In twenty-seven complete autopsies in cases of tubercular meningitis that he reports he found old tubercular lesions in twenty-five cases. He quotes Orth as maintaining that there is a distinct relation of cause and effect between caseous deposits and the later development of tubercular meningitis. Reider, in the *Munchener Medicinische Wochenschrift* of December, 1889, reports thirty-two cases of tubercular meningitis, in almost all of which the disease was consequent to another tubercular affection.

By what avenues do the bacilli go from the cheesy nodules through the body, to the meninges? By the blood-current. The peculiar distribution of meningeal tubercle, and the researches of Weigert are the proof of this answer.

It is impossible to say in any case what agency it was that disturbed the cheesy masses of the body and caused them to send out their pestiferous colonies to settle in the meninges. Sometimes it seems to be the debility following whooping cough, or measles, that lights up the smouldering tubercular processes. Sometimes it is trauma. Dr. Clinton, of Leeds, a few years ago read before the British Medical Association an interesting paper on the medicolegal aspect of the tubercular meningitis occurring in children after slight injury to the head, for instance, after being struck on the head by their schoolmasters.

There are some stumbling-blocks in the way of too fine theorizing in this matter. For instance, a case reported to the Royal

Academy of Medicine, of Ireland, by Dr. Bewlett, would seem to show some contradiction of several points in the modern doctrine. The doctor, according to the London Lancet of June 11, 1892, showed to the Academy a spinal cord from a case of chronic internal tubercular pachymeningitis. The disease had lasted four years, causing complete loss of motion and partial loss of sensation in the legs. At first there had been marked incoördination with increased reflexes, but afterwards the reflexes culminated in permanent rigidity. Four years after the paralysis showed itself, the spine became curved, the tenth dorsal spine becoming prominent. This singular curvature became rather more marked. Finally he died of tubercular meningitis. At the post-mortem examination, it was found that the external surface of the dura mater was healthy; the internal surface was thickened. This thickening was most marked in the lower dorsal region, where there was about one-sixth of an inch of tough whitish tissue growing from the dura and attached to the arachnoid and pia mater. This tissue thinned off gradually above and below. On microscopic examination this structure was seen to consist of granulation tissue, containing giant cells and tubercle bacilli and in many places had become caseous. This tissue compassed the cord in the lower dorsal region. The cord showed ascending and descending degeneration above and below the point. The ninth, tenth and eleventh dorsal vertebrae were carious and there was cerebral tubercular meningitis. The disease had started in the internal surface of the dura mater and the bone disease was secondary. That this was the course of the case is shown by the following facts: (1.) The external surface of the dura was healthy; the internal diseased. (2.) The spinal disease did not show itself till three years after the paraplegia had become complete. The unsatisfying part of this report is the neglect to state whether or not there was evidence of old tuberculization elsewhere in the body than in the spine.

The question of the etiology of tubercular meningitis is a somewhat knotty one. It may have occurred to you that not much has been written on the subject by the abler men of the profession. Dr. Landon Carter Gray, however, writes very glibly on the subject in the recently published "American Text Book of Diseases of Children." He says on page 626: "The

etiological factors of tubercular meningitis are hereditary, tubercular infection, age and erythema nodosum. A tubercular heredity produces of course the tubercular manifestation in the different organs of the body, but there has never been produced any proof that tubercular meningitis is hereditary except in this general sense." What in the world can the doctor mean by that last sentence?

Well, we have traced our bacilla back to the glands, or bones or lungs. How did they come there? Dr. Walter Carr reports, Lancet, May 12, 1894, on this point so far as he was able to elucidate it by one hundred and twenty necropsies made at the Victoria Hospital upon children suffering from tubercular lesions. In four cases he could not find any primary lesion. In eleven cases cheesy nodules existed in several widely separated parts of the body, and in these he felt constrained to hold that multiple tuberculous affections may be sometimes altogether independent of one another. In thirteen children the tuberculous mischief was confined to the glands, in seven to the bronchial, in eight to the mesenteric, and in one both sets. Ninety-two cases are left; of these the mischief apparently began in or was limited to the bones or joints in seven (including three of middle ear disease), in forty-seven it commenced in the thoracic glands, in thirteen in the lungs, in eight either in the lungs or the thoracic glands, in six the starting point seemed to be in the intestine, in seven in the mesenteric glands, in two in the cervical glands, and in two in the kidney. Then as a summing up of all the evidence of clinical and experimental tuberculosis, he holds: (1.) That a primary lesion in the lungs or intestines means a direct local infection. (2.) That bacilli may pass through the lungs or the internal walls without producing any recognizable lesion, and that they then at least as a rule, enter the lymphatic vessels and not the blood vessels, and (3.) That a primary tuberculosis lesion in the mesenteric or bronchial glands is due usually to bacilli which have entered through the intestine or lung respectively and not at some remote point. He holds further that the bronchial were more frequently affected than the mesenteric glands and that therefore the original entrance of the bacilli to the system of children was more frequently through the lungs than through the food tract. This conclusion, though in accord

with the researches of Rilliet and Barthez, and Simmonds and Walter Coleman, is opposed by those of Dr. Sims Woodhead, who found in one hundred and twenty-seven autopsies of tubercular children that the bronchial glands were caseous in ninety-six cases and the mesenteric in one hundred cases, and the mesenteric alone in fourteen cases. We have now seen that the children who die of tubercular meningitis usually receive the tubercle bacilli in the air that enters their lungs or in the food that enters their stomachs. Are the bacilli never inherited? Osler, in the "American Text Book of Diseases of Children," puts the answer well: "Current opinion on this point may be expressed as follows: While in a few cases tuberculosis is transmitted directly from parent to offspring, in the great majority of all cases, the heredity does not relate to the transmission of the seed, but of a disposition of body, a type of tissue-cell favorable to the development of the disease in case of accidental infection."

You have heard an enumeration of symptoms that are to be found in children who have simple meningitis and those that have cerebrospinal meningitis. The symptoms of tubercular meningitis are like unto them. The symptoms of tubercular meningitis vary, as do those of simple and cerebrospinal meningitis, according to the location and amount of the effusion and the degree of poisoning from the products of the bacteria that cause the inflammation. From the fact that usually tubercular inflammation is situated at the base of the brain, we would expect and correctly, various and complicated interference with motion and sensation, and function of different parts of the body. From the comparatively slow development of tubercle bacilli we would expect and correctly, that an inflammation produced by them would have longer and more deceptive prodromata than would one caused by the pneumococci, for instance.

Usually for a few days or weeks, occasionally months, the mother of the patient notices that it does not look well, is cross, or strangely apathetic, and is "losing its appetite." There is little or no fever yet. Suddenly there comes sudden and repeated and unexplainable vomiting, accompanied by rise of temperature and an intense headache and possibly a convulsion. The pain in the head is usually referred to the forehead. Sometimes

it is paroxysmal and causes the sufferer to utter sudden loud shrieks, the "hydrocephalic cries" of olden literature. The slightest sounds annoy and there is photophobia. Contracted pupils are the rule; rachialgia is occasional and constipation usual. The expression is frowning. Then follows a quieter period of rather indefinite length. The patient loses sense of pain. The muscles in the back of the neck contract and the head "bores in the pillow." General or partial convulsions, or stupid delirium, dilating pupils, and strabismus, irregular pyrexia and pulse rate, the *tache cerebrale*, patches of erythema, the carinated abdomen, are commonly features of this stage. A rapid pulse, convulsions, dilated pupils, optic neuritis, loss of control of the sphincters, ptosis, a temperature ranging from ninety-three degrees to one hundred and six degrees, mixed palsies and paralyses, and more or less profound coma, precede death.

From the symptoms produced by the inflammation of the meninges, alone, it is impossible to say whether a given case of meningitis is tubercular or simple or cerebrospinal. But there is usually a plenty of circumstantial evidence to aid in the diagnosis. A thorough physical examination of the child for evidence of tubercle or injury, the previous history of the patient with particular reference to the recent occurrence of measles or whooping cough or any of the debilitating diseases of childhood, the prevalence or absence in the neighborhood of an epidemic of cerebrospinal meningitis, will be of more assistance than any set of symptoms. It should always be remembered that tubercular meningitis is altogether the most common variety. The physician who, in doubtful cases of meningitis, certifies to death from cerebrospinal fever not only unreasonably startles the community, but he is very likely to be made uncomfortable by the revelations of the dead-house.

The prophylaxis of tubercular meningitis is two-fold: (1). The prevention of primary tuberculosis; into that subject I cannot go. (2). The curing of primary tuberculosis. It is clearly our duty to give serious attention to the cheesy glands of children, however few and slight may be the subjective symptoms to which they give rise, and to use any means at our command, surgical and medical, to snatch our little patients fro m the

that threatens them while they carry about with them nests of tubercle bacilli.

As to treatment, if we cannot find positive evidence of tubercular deposits elsewhere in the body, we would be justified in hoping that it was not the tubercle bacillus, but some less fatal bacterium that had attacked the meninges and was now causing the headache, and spasms and delirium or stupor or whatever symptoms the patient might have. And on that supposition we might resort to somewhat active therapeusis, but not blistering I hope, and not too much freezing with ice-caps. But if we have tubercular deposits elsewhere in the body and a meningitis of slow development it is barbarous to torment the dying child. He should be put in a quiet, darkened room, treated symptomatically and permitted to die in as much peace as is possible under the circumstances. Acting on the theory that it was the compression of the brain by the effusion that was the actual cause of death in tubercular meningitis, many able surgeons have performed operations to relieve the intracranial pressure; but although they sometimes give temporary relief from some of the symptoms, in no case were they successful in saving life or even apparently in prolonging it.

It is inconceivable, according to our present knowledge, that a case of tubercular meningitis can recover. Therefore, although several cases of recovery have been reported, the reporters are believed to have made errors of diagnosis. Only when we have discovered an agent that will do for the tubercle bacillus what quinine does for the protozoa of malaria, can we hope for the cure of tubercular meningitis. That agent we may have this year or next, or it may be reserved for the twentieth century, but we all feel that it can not for long elude the faithful, heroic search that is now made for it the world over, by thousands of the keenest minds and most skillful hands that have ever been vouchsafed to the human kind.

# A CASE OF ACUTE MILIARY TUBERCULOSIS, OF SO-CALLED TYPHOID FORM.

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This case seems to me to present many features of interest, and a somewhat detailed report may add to our knowledge of the points of resemblance between tubercular meningitis and typhoid fever. At the present time competent observers are of the opinion that typhoid fever has been modified by various causes, in various ways, especially by malaria, and later by the "grippe," until the old-fashioned, typical, regular fever is now in the minority, and cases, more or less anomalous, especially as to duration, are the rule. It is by no means infrequent for cases to last three or even four months, even where there has been no relapse. This extraordinary length, especially in cases of recovery, or in fatal cases where the diagnosis of typhoid has not been confirmed by an autopsy or by the discovery of the typhoid germ, leads me to think that it is a fair question whether there may not be another continued fever, which eventually will be differentiated and classified. In this opinion I am not alone.

The epidemic of typhoid at Middletown, Conn., in the autumn of 1894, has attained a national notoriety, from its origin in infected oysters, which were eaten raw by many of the victims. The prevalence of this fever led the physicians to scrutinize with extreme care all febrile attacks. Hence, when my patient was taken ill, the possibility of typhoid infection was thoroughly considered.

J. J. G., male, twenty-two years old. For about three years past had been employed as an attendant on the insane. Prior to that had lived on a farm in Maine, his native State. He was six feet tall, was strong and in fair flesh. Habits good. Said he had never been ill in his life. For some time previous to his sickness he had undergone treatment for acne at the hands of a homeopath, and his associates thought this had acted unfavorably on him. He had also been troubled by a posterior nasal

catarrh. During the past winter, apart from these minor ailments, he had felt perfectly well, and attended to his duties with his usual efficiency and fidelity.

On Friday, March 8, 1895, while out walking, was suddenly, at 3:30 P. M., seized with a feeling of weakness, with severe pains in his legs and arms, and some occipital pain. He had no chill, but at times a slight chilliness, lasting only a few moments, and applied to me for some medicine for "a cold." The next day he felt better, and insisted on working. On Sunday, the third day, muscular weakness was pronounced, and he complained of dizziness, most marked when he was in motion, and hardly, if at all noticeable when he was still. He was at once ordered to bed. Temperature, ninety-nine and eight-tenths degrees; pulse, ninety. (He informed me that his normal pulse was eighty). There was no cough, a slight nasal and pharyngeal catarrh, no coryza, no pain in head, body, or limbs, some vertigo and great weakness. He did complain of a "disagreeable feeling" in his occiput, and said that when anyone touched the back of his head he felt a "shooting feeling" towards his eyes.

From March tenth to fourteenth there was no change in his symptoms. Temperature fluctuated between ninety-nine degrees and ninety-nine and six-tenths degrees, usually ranging highest at noon. He had slight vertigo on motion, and "felt weak."

March fifteenth to seventeenth he felt better, although his temperature was a trifle higher, and sat up occasionally for short periods. During these ten days he had slept well at night, his appetite was good, he had no nausea, and no headache. Bowels moved regularly and naturally. Urine normal. The only nervous symptom, besides the occipital *discomfort* before mentioned, was a morose disposition, chiefly displayed in a wish to be let alone, and a strong aversion to our two night attendants, from whom, as a rule, he refused to take food or medicine. At this time this was regarded as a sick man's whim, more especially as when well he had always been a reticent, peculiar, and on the whole unsocial person. He had made few intimacies, usually kept his own counsel, attended to his own business, and expected other people to attend to theirs.

On the morning of March eighteen he appeared almost well, but was practically in bed, and was cautioned against making

any exertion or exposing himself in any way. On the evening of that day, without any discoverable reason, the temperature suddenly ran up to one hundred and four degrees. A careful and minute examination revealed no abdominal or thoracic lesion. There was no tympanites, gurgling, pain or tenderness. There was good vesicular respiration in both lungs, and no dullness or rales detected anywhere. There was no cough nor dyspnea. In view of the existence of small cavities at right apex, it may be said that some evidence of their existence should have been elicited, but as my object is to state facts, will say now that they were *not* discovered during the entire illness. It may be said, however, in partial extenuation, that a family history of tubercular disease was denied by the patient, and later by his brother, who came to nurse him; both being ignorant of the fact that a paternal uncle and a paternal grand-aunt had died with "consumption." This, and the fact that attention was mainly directed to the possibility of the disease being an anomalous typhoid, induced me to examine the chest daily, mainly for the purpose of detecting the results apt to follow hypostasis.

From the eleventh to seventeenth days, the temperature oscillated between one hundred and two degrees and one hundred and four degrees, while the pulse only twice rose to one hundred, usually being about eighty-two to eighty-five. During these seven days he had absolutely no abdominal symptoms. Bowels moved about once in two and a half days. It may as well be said here that during the entire course, which lasted forty-seven days, this was the average. There was a tendency to constipation, and only twice were enemata of warm water given or required. Every stool but one was carefully inspected by the writer, and every one was as normal in appearance and consistency, as in a healthy child living on a strictly milk diet. It was found impracticable to examine them for bacilli, but as a matter of routine, each stool was thoroughly disinfected.

During this week no chest symptoms were noted, and his head felt clear and free from discomfort. There was no ocular trouble, no photophobia. He could see well and asked to have a calendar that he might keep run of the days.

On the nineteenth and twentieth days there was a decided re-

mission, the temperature once going to ninety-nine degrees, and in view of the absence of all abdominal symptoms, I felt inclined to diagnose the case as a simple remittent.

From twenty-first to twenty-fifth day the temperature ran up to one hundred and four degrees again, with occasional remissions. On the twenty-fourth day of the illness, and the fourteenth day of the temperature, I found for the first time three small rose spots over left scapula. (These may occur in tubercular meningitis. See Da Costa.) These were at once carefully encircled with ink, and never disappeared, although in about a week they lost their bright color, (disappearing under pressure, and rapidly returning,) leaving a yellowish spot, which remained unchanged. While these spots seemed to point to typhoid, yet in view of the normal stools and continued absence of abdominal symptoms, as well as the good appetite, freedom from all gastric irritation, and fairly clean tongue, with absence of delirium, etc., I adhered to my conviction that whatever might be the cause of the fever, it was certainly not typhoid.

A fall to one hundred and one degrees occurred on the afternoon of the twenty-fifth day, and on the morning of the next day the temperature was ninety-nine and eight-tenths degrees.

From now on to date of death there were several irregular remissions, and a reference to the chart will enable the reader to spare himself needless repetitions.

On the thirtieth day there was some restlessness, and from now on a tendency to insomnia, most marked after midnight.

Between the sixteenth and thirtieth days he was seen by several physicians, none of whom were willing to make a positive diagnosis, although the majority were in favor of typhoid by exclusion. The first ten days, which I had considered a mild "grippe," were thought to be *possibly* a prodromal period of typhoid. But however opinions might honestly differ, there was only one line of treatment possible, viz.. rest in bed, isolation, liquid (exclusively milk) diet and a supporting expectant treatment.

On this same day (thirtieth) there was considerable occipital pain, or rather an uncomfortable feeling, which, like the same symptoms earlier in the case, in connection with the vertigo,

confirmed my belief that he had a basilar meningitis, even though many characteristic features were lacking.

The case progressed very comfortably, on the whole, until the thirty-eighth day, the restlessness and insomnia being controlled by small doses of chloral (gr. viii) with bromide (gr.xx), sometimes repeated once during the night; and by alcohol baths. During this time his stomach was in excellent condition, and he took willingly and well three quarts of milk daily. Stools were normal. Abdomen was soft and flat. There was no tympanites, gurgling, pain or tenderness. He had a tendency to lie on his back or left side, and would occasionally cough a little. This seemed due to position, and was always relieved by a change of posture. Various coarse and medium moist rales and bronchi were found in both lungs, in various parts at various times; often were absent; respiration was easy and regular, there was absolutely no expectoration; vesicular murmur and resonance were good. During these same ten days there was no delirium, but a slight bewilderment on first awakening, which rapidly disappeared. There was a slight deafness, which later became more pronounced.

On the thirty-seventh day he expressed himself as feeling very well and was allowed a short interview with a special friend. He slept well the whole night without medicine, and during the entire forenoon of the thirty-eighth day, hardly aroused when his temperature was taken. I say sleep, for such it appeared, natural in all respects. During this prolonged somnolence he took milk three times, and urinated twice, without awaking. Up to this date he had only wet the bed once.

He awoke at one P. M., and seemed very confused and deaf. His pulse was 120 and dicrotic. Heart somewhat labored, but both sounds clearly heard. His respiration, which during his prolonged sopor had been regular and easy, now assumed the Cheyne-Stokes character. Very soon there were symptoms of collapse. Skin became cold, but was dry; pulse thready, etc. Whiskey was given freely (up to this date alcohol had been withheld), at first every half hour, and later every hour or two, to the amount of eight ounces in twenty-four hours. He also received a hypodermic of Strychnia Sulphate $\frac{1}{30}$ gr. every five hours. The Cheyne-Stokes respiration was justly considered

ominous, and his friends were summoned. It subsided, after thirty-six hours, but from that time until his death, it recurred irregularly for short periods, and in the intervals respirations ranged from thirty-five to forty per minute. From now on also he was for a large part of the time in a state of stupor, although he occasionally could be roused, and several times seemed to recognize his friends and the physician. His speech became very thick and indistinct. He took milk and whiskey only by persuasion.

As a rule he swallowed well, after the first mouthful, but occasionally deglutition seemed painful, and he would strike at the nurses, close his mouth firmly, and struggle so violently that at such times efforts at feeding would be discontinued. For similar reasons rectal feeding was not resorted to. During the last ten days of his life he averaged two quarts of milk daily, besides from six to eight ounces of whiskey. During this time urine and feces were passed involuntarily. He had maintained good flesh up to the thirty-eighth day, but after that emaciated rapidly. He died at 1:30 A. M., on the forty-seventh day, complete coma having ensued twelve hours previously.

REPORT OF AUTOPSY NINE HOURS AFTER DEATH.

The brain showed marked opacity of the pia over its convexity. The pia was extremely adherent over the entire brain, and especially at the base. Microscopical examination of the pia and the fluid in its meshes revealed tubercle bacilli in large numbers. A few tubercular nodules were found along the fourth branch of the middle cerebral artery in the sylvian fissure. Many other varieties of bacilli were found in the fluid in the pial meshes, aside from the tubercle bacilli. The exact diagnosis of these could not be ascertained without culture growths which were impracticable.

Frozen sections of the brain showed no marked change in the cell outline or contents, and with the exception of extreme hyperemia, nothing further abnormal was found.

Consolidation was found at the upper part of the right lung; and in its central portion were two cavities—one one-half inch and one about one quarter inch in diameter. Around these cavities the central portion of the upper lobe was infiltrated with

miliary tubercles. The cut surface showed these to be evenly distributed, and studding the lung very closely. In places these miliary nodules were conglomerated, solution had already taken place, and small abscesses were forming. The pleura at the apex showed quite extensive old adhesions, but these were easily broken up by the fingers.

The left lung presented but few pleural adhesions at the apex. About the middle of the upper lobe the pleura was quite adherent, and at this place the lung was puckered and found to contain the remains of old tubercular cavities, quite firmly surrounded by fibrous tissue. Aside from this lesion the left lung was normal and capable of good aeration.

The spleen was very large and firm, and on section appeared of a dark slate color. The kidneys were large, but the glandular element showed no disease changes. The mesenteric glands in several places were enlarged, hard, and nodular. On section they were found to contain pus, the result of checsy degenerations. This pus was examined microscopically and presented tubercle bacilli in great numbers. The liver was large and exhibited that peculiar dark brown appearance found in long continued fevers, consequent to high temperature and great metabolic changes of the blood.

On opening the intestines the jejunum and ileum displayed considerable infiltration, and great hyperemia of the mucous membrane was noticed. This hyperemia was particularly prominent in the iliac portion about Peyer's patches. These patches were found to be ulcerated in two places; in one about eight inches from the ileocaecal valve, and the other nearly two feet from the lower end of the ileum. These ulcers were from one-half to three-fourths inch in diameter, and were surrounded by congested and inflamed mucous membrane. The ulceration had extended to the outer coat in the first instance, but in the second and larger ulcer the necrosis was confined to the mucous and muscular coat. The borders of these ulcers were raised and firm, and in them were found tubercle bacilli, which also swarmed in the Peyer's patches which presented a shaven beard appearance.

This case lacked many of the prominent features of acute general miliary tuberculosis, aud a satisfactory diagnosis was

not made during life. There was a marked paucity of symptoms as compared with the extensive lesions. But the following conclusions it seems to me, may fairly be drawn.

1. There was an old, latent, tubercular disease of the left lung.

2. The first ten days may be considered as a case of "grippe," which called into activity the old tubercular trouble.

3. The period from the tenth to the thirty-eighth day represents the invasion of right lung, intestines, mesentery, and brain by tubercule.

4. The last nine days represent an acute tubercular meningitis.

5. This case shows the need of extreme care in the diagnosis of prolonged continued fevers, of irregular type, both as regards onset and course, especially where there is absence of many, if not all of the socalled pathognomonic symptoms, and this, not so much in the way of treatment, which in any event must be practically symptomatic, supporting, and expectant, but as a factor in determining the future prospects of our patients, in case of their recovery.

# PNEUMONIA AND THE TREATMENT OF ITS FIRST STAGE BY FREE STIMULATION.

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During the past few years I have been much interested in the treatment of Pneumonia. I submit it, as a subject for your consideration to-day as I deem it worthy of your attention. Although medicine in all its branches has advanced with giant strides, the etiology of pneumonia—the most formidable of acute diseases—is still a bone of contention for medical writers.

The nature and cause of this disease are as yet undetermined. Some recent observers have advanced the theory of its being due to a microbic origin; there is not sufficient evidence however, to establish the dependence of the disease on one specific germ. Those who adopt the German teaching of its being a general rather than a local disease, base their conclusions on its resemblance to the acute general diseases in its sudden advent with initial chill, its typical course, a brief termination and definite duration. The observers who to-day agree with the older writers in its being a local inflammation, offer arguments as tenable as the above to sustain their theory. They believe a disease that sometimes terminates in three days and again in nine or twelve, whose symptoms in some cases disappear suddenly by crisis and again gradually by lysis, whose terminations might be abscess, gangrene or cirrhosis, should not be classed with diseases which run a typical course and have a definite duration.

In comparing the symptoms of pneumonia with those of acute inflammations, we find they bear a close resemblance. Both begin with chill and rise of temperature. In acute inflammations the duration of the former and the course of the latter depend on the region or organ affected and the severity of the attack. The terminations of both diseases are the same, viz.: Resolution, abscess, gangrene and chronic inflammation.

It is neither necessary nor is it within the scope of this paper

to enquire further into the etiology or nature of this disease; it is my intention to deal more particularly with its treatment. In our latest works on therapeutics the treatment recommended for this disease is the expectant one. In the first stage of the disease for the purpose of relieving the congestion Venesection was formerly practised. In plethoric subjects this might be done at the present day and give better results than are obtained by the expectant plan.

A few years ago I read a short paper before the Norwalk Medical Society on the treatment of the first stage of pneumonia by the free use of heart stimulants. Since writing that paper I have learned of other observers who have obtained satisfactory results by administering stimulants in free doses at the beginning of the disease.

Dr. Petresco was, I believe, the one who first recommended this method of treatment. He gave digitalis in doses amounting to ninety and even one hundred and fifty grains of digitalis leaves, administered as an infusion in twenty-four hours. He states that he has obtained by this treatment satisfactory results in cases of pneumonia complicated with bronchitis and pleurisy, and he claims in the most positive manner to have cut short undoubted cases of croupous pneumonia so that within twenty-four to forty-eight hours—the time necessary for the effects of the digitalis to be demonstrated—he has succeeded in obtaining sudden and almost absolute reduction of the temperature to the normal, accompanied with a reduction of the pulse, and a general improvement of the patient's condition. Dr. Balfour in an article which appeared in the Edinburgh Medical Journal in 1891, has also strongly advocated digitalis in combination with chloral. The dose as given by him was gr. x choral to ℥ ss. of the infusion digitalis. This dose was given every hour till the temperature fell to normal, which, according to Balfour, it rarely failed to do. Dr. Horsley in an article which appeared in the Practitioner for November, 1891, recommends the hot infusion of digitalis. He claims to have used it in twenty cases; commencing in each instance with gr. x of calomel. The infusion was given in doses of ℥ ss. as hot as the patient could drink it. In from six to ten hours profuse perspiration occurred in every case, followed in twelve cases by normal temperature. In the

last report of Surgeon General Tryon of the Navy, he states that during the year there were thirty-three cases of acute pneumonia admitted to the hospital, and of that number thirty-one recovered. This unusually low mortality rate was attributed to the method of treatment adopted, which consisted in the hypodermic injection of $\frac{1}{30}$ to $\frac{1}{25}$ gr. of the sulphate of strychnia every three or four hours, together with the free use of alcoholic stimulants.

If we consider for a moment the morbid anatomy of the disease during the early stage, viz.: the stage of congestion, we can better appreciate the rationale of this method of treatment.

Whether we consider the disease constitutional, local, or due to bacterial origin, it must be admitted that the first recognized local manifestation is a congestive hyperemia. The degree of this congestion and the duration of its existence determine the severity and extent of the inflammatory changes. In this early stage the pathological processes are almost confined to engorgement of the capillaries. If we relieve these overdistended vessels by prompt and appropriate treatment we may reasonably hope to limit and modify the succeeding inflammatory exudation. By increasing the vis a tergo of the blood current we have a rational and also an effective method of relieving this hyperemia. Free stimulation, by increasing the force of the heart's action, drives the blood through the engorged capillaries; by removing the stasis it diminishes the amount of extravasation and consequently modifies the succeeding inflammatory changes.

I have been treating the first stage of pneumonia during the past few years with DaCosta's heart stimulant and brandy. These were administered in free doses at the onset of the disease. Although my experience with this treatment is not an extensive one, the results obtained were so good and the fact that the same plan of treatment has proven so efficacious in the hands of more competent observers, has prompted my introducing it as a subject for discussion to day.

The following are the histories of a few cases treated by the above method:

Case No. I. Mr. A., age thirty-six, occupation tailor, was taken sick April twenty-first with pneumonia in apex right lung. Temperature one hundred and three and five-tenths degrees,

pulse one hundred and twenty, characteristic sputa. Treatment, DaCosta's heart stimulant in tablet form, one every third hour, also ʒ ss. of brandy every three hours. April twenty-second, temperature one hundred and five-tenths degrees, pulse one hundred, patient has less pain, feels more comfortable. April twenty-third, temperature ninety-nine degrees, pulse one hundred, cough present with brick dust sputa, amount of expectoration not great. April twenty-fourth, temperature ninety-eight and six-tenths degrees, pulse ninety, patient expressed himself as feeling well, and from this on made an uninterrupted recovery.

Case II. Mr. B., age thirty-five, occupation clerk, taken sick September seventeenth, pneumonia in apex right lung. Temperature one hundred and three and six-tenths degrees, pulse one hundred and twenty-four. Treatment, DaCosta's heart stimulant, brandy. September eighteenth, temperature ninety-nine and five-tenths degrees, pulse one hundred, patient feels better. September nineteenth, temperature ninety-nine degrees, pulse ninety-six, patient a little delirious during the night, cough present with characteristic sputa, patient was restless during sleep for a few days. Pulse and temperature remaining good. Recovery complete.

Case III. Mr. C., age sixteen, occupation schoolboy, was taken sick March twenty-seventh with severe chill. When seen by me a few hours later patient was delirious, unable to answer questions intelligently, respirations were rapid, conjunctiva congested. Temperature one hundred and four and five-tenths degrees, pulse one hundred and thirty-five, irregular. Diagnosis, pneumonia at base of right lung. Treatment, DaCosta's heart stimulant and brandy, half an ounce of the latter and a tablet of the former were given alternately every hour. March twenty-eighth, temperature ninety-nine degrees, pulse one hundred and ten, regular, delirium gone. Continued same treatment at longer intervals. March twenty-ninth, temperature ninety-eight degrees, pulse one hundred, regular, cough present with characteristic expectoration. Patient from this on made an uninterrupted recovery. This case was seen by a consultant who, I believe, is present.

Although my experience with this method of treatment is a

limited one, I am, nevertheless, convinced of its efficacy. I believe the infusion of digitalis or sulphate of strychnia administered as recommended, in free doses, will give as good results or probably better, than I have obtained with DaCosta's heart stimulant and brandy.

The treatment of pneumonia by the expectant plan, as Dr. Petresco affirms, is irrational and dangerous.

The treatment of the first stage by free stimulation is not only a scientific method, but the statistics of competent observers prove it to be a valuable one.

Gentlemen: If I have succeeded in convincing you that this treatment is worthy at least of a practical test, I have accomplished my object.

# MODERN IMPROVEMENTS IN THE TREATMENT OF DISEASES OF THE SKIN.

R. A. M'DONNELL, M.D., NEW HAVEN, CONN.

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At the last meeting of the State Medical Society, one of the ablest of our older practitioners deprecated the fact that of late years no really great discoveries in medical science had been made, and alluded in a humorous way to the search after novelties in gynecology and surgery. No one would, I think, after looking into the matter, attempt to apply these same criticisms to dermatology, in which domain of medicine some notable results have certainly been achieved.

Believing that not all have either the inclination or the time to study the advances of dermatology, it is my purpose in this paper to outline the improvements in cutaneous therapeutics which have been perfected of late years.

Not only are there many efficient drugs at our disposal now that were unknown ten years ago, but the method of applying medication to a diseased skin (and it is of this phase of the subject that I particularly desire to speak), have multiplied within the same period.

There was a time not long ago when no one thought of treating the skin locally in any other way than by salves or powders, lotions or baths; but now these methods, while possessing as much value as ever, have been supplemented in a particularly gratifying way by the introduction of such agents as plaster mulls, medicated soaps, zink limes and the like, which would be sorely missed now if taken from our armamentarium.

But even in the use of salves new ideas have had their influence. Instead of the common lard which was formerly about the only basis for salves and ointments, there are now in common use lanolin, agnine, adeps lanae, bassorin, resorbin and vaseline, each one possessing some special claim to favor. For instance, *lanolin* has the distinct advantage of not becoming rancid (as it is immune against microorganisms), of being mis-

cible with water, and of possessing great penetrating powers. Never getting rancid, it is non-irritating even to delicate skins; being miscible with water, it is applicable to diseases like moist eczema, where salves are not usually borne; penetrating the skin so readily, it makes a good base for ointments against ringworm, and is a valuable vehicle for the inunction cure of syphilis. But it is too sticky to use alone, and should be combined with one-third its bulk of olive or sweet almond oil, or water, with which it makes a fine cream.

*Agnine* is a much cheaper ointment base than either lanolin or adeps lanae, although it is as unirritating as either. It is simply the unrefined fat obtained from wool, retaining the characteristic odor of the latter. Its dark color and disagreeable odor may be disguised by always combining it with some white powder like talc, and scenting with oil of rose.

A body related to the two preceeding is *adeps lanae*, which, like lanolin, is a purified agnine. The former is, however, only mechanically obtained from unpurified wool fat, while the latter is a chemical product. Adeps lanae costs more than agnine, but while retaining the latter's good qualities of being bland and protective, it has the advantage of being almost inodorous, and its color is a fine waxy, translucent yellow. In itself it is an excellent remedy for chapped hands and dry skins, and it forms an ideal ointment base when combined in equal parts with some bland oil. It is even more miscible with water than is lanolin.

*Bassorin* paste is an ointment base resembling vaseline in consistency. It was derived from tragacanth by Dr. Elliott of New York, and is useful like the other bases just mentioned because it forms an excellent protective covering for an inflamed skin, is permeable to water, and is neutral in reaction. It should be lightly rubbed over the part, when it dries in a thin film, resembling collodion, but not irritating like the latter.

*Resorbin* is a combination brought out last year by Ledermann, who sought a substance which should, without specially hard rubbing, deposit a considerable quantity of fat in the epidermis, and only leave enough upon the surface to protect it from the air. Such a fat is resorbin, a fat emulsion which penetrates easily into the skin by reason of the extremely fine subdivision of its fat molecules. It is composed of almond oil, wax

and water, with a small percentage of a lime and soap solution which serves to hold the ingredients in suspension. Resorbin is miscible with all fats, and it is especially good combined with lanolin. It possesses a remarkable power of penetration; small quantities applied to the skin with even pressure, disappear before one's eyes, leaving the skin for hours soft and elastic. The especial indications for the use of resorbin are as follows:

(1.) Conditions of hyperkeratosis like ichthyosis, scaly and crusted eczema, scleroderma, etc.

(2.) For the introduction of medicaments into the skin, like chrysarobin and tar.

(3.) For the introduction of medicaments through the skin into the body, especially mercury.

The last ointment base spoken of, vaseline, is so well known as to need only a bare mention.

Leaving the consideration of salves and their application for the present, let us turn now to the so-called hard pastes, first suggested by Pick, of Prague. They consist of various combinations of gelatine, glycerin and water, forming a product which is hard when cold, but when slightly heated becomes soft enough to apply with a brush. By reason of the gelatine, these pastes exercise an elastic compression wherever applied, and are valuable in all acute dry inflammations of the skin. A favorite formula of mine is zinc oxide 30, gelatine 40, glycerine 50, water 90. This I have used frequently and with excellent effect in such cases as varicose eczema of the legs, herpes zoster, various forms of erythema and dermatitis. The vessel containing the paste is set in another of hot water, and when soft enough, is applied to the part with a small paint-brush; and to facilitate the hardening process, tufts of absorbent cotton are lightly pressed upon the semisoft paste, and incorporated in its substance. Such an application is protective, non-irritating, and by producing a local anemia from pressure, opposes inflammation. The paste may be left on for two or three days, and then removed easily as a whole. Of course any other drug than zinc oxide may be combined at will with such a base.

Another paste, very universally applicable to inflammations of the skin, no matter in what diseases they are found, is one suggested by Lassar; it contains 50% powder to 50% fat, and 2%

salicyclic acid as an antiseptic. By the way, let me state right here that any application for the skin which neglects the principles of antisepsis, is as unjustifiable as a similar neglect would be in surgery. To return to Lassar's paste, the formula most generally used is:

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| | |
|---|---|
| Acidi Salicylici, - | 2 |
| Zinci oxidi et Amyli, ää | 24 |
| Petrolati, - | 50 |

This is spread in a thick layer on a thin piece of cloth, and applied closely to the diseased part, from which it may be easily removed later by rolling up the edges of the now hardened mass.

It was only a step from the use of salves which needed covering with a bandage, to the idea of salves which should already be spread upon a bandage, and indeed incorporated into its substance, as in the so-called plaster mulls. These consist of strips of wide-meshed muslin cloth, which have been impregnated with various medicaments, and held to the proper consistency by some such agent as cacao butter. These mulls have not only the great advantage of being cleanly and always ready for use, but they contain to each unit of area a definite amount of the drug to be used, so that control of the dose may be preserved, a rare thing in dermato-therapeutics. Farther than that, they may be accurately and evenly applied to irregular surfaces, such as the face or ears, places notoriously difficult to treat. The chief disadvantage of this form of treatment is the cost of the mulls, which is considerable. But on the other hand, who would not prefer to pay a little more for a cleanly application like this rather than have his face smeared with some nasty oily salve?

All that has been said in favor of plaster mulls applies to the more recently introduced gutta-percha plaster mulls, which have the advantage over the preceding of being backed by a very thin layer of gutta-percha to prevent any escape of the medicament outwardly. This ensures a much deeper and more powerful action on the skin, besides absolute protection from infection from the air, and is therefore more especially indicated in deep-seated processes, like lupus, rodent ulcer, errors of pigmenta-

tion, etc., etc. They are to be applied by pressing firmly upon the part, to which they closely adhere at the temperature of the body. One use for which they are well adapted is the formation of a protective mask for eczema of children's faces. Frequently eczema of this kind cannot be cured for many months without a protective mask of some kind. Such a mask would be constructed as follows: A strip of zinc oxide plaster mull is laid over the forehead to completely cover it from the hair border to below the eyebrows; then a second strip is pressed down upon the nose and cheeks so as especially to cover the folds of skin by the side of the nose; this strip should reach to the ears. A third narrow strip covers the overlip and middle part of the cheeks; and finally comes a fourth broad strip over the chin and lowest part of the cheeks. Places are now cut out for the eyes and mouth, and any little crevices between the strips are filled in by small pieces of mull. Next a thin layer of Pick's gelatine paste (already described) is painted over the whole area with a brush, and while this paste is still warm and soft, two linen bandages are quickly laid upon it at forehead and chin, long enough to fasten behind the head, and then one more thin layer of gelatine paste applied. The whole thing is now painted over with a ten per cent. solution of chromic acid, to hasten the hardening process and increase the impermeability of the mask. This completes the process for the present, the mask being allowed to remain on for some twenty-four hours. After that it can easily be removed entire by the use of a little benzine to loosen adhesions. It should then be freed from scales or crusts by means of cotton soaked in benzine, and the inside prepared as was the outside with gelatine paste and chromic acid. Such a mask is very light, cool to wear, can be removed and applied at any time, exercises a beneficial and not unpleasant compression at all times, and makes a most efficient bandage for any form of local medication desired. Gutta-percha plaster mulls cost on the average a dollar per yard, eight inches wide.

The whole subject of soaps is of considerably more importance than we are wont to ascribe to it, not only in the cosmetic role that soaps play in everyday life, but also in the actual treatment of disease. There are to be distinguished the soft soaps (combinations of a fatty acid with a potassium salts) and hard soaps

(fat with sodium salts). Most soaps contain free alkali, which dissolves and destroys the protective keratin of the skin. For this reason, only neutral soaps should be used to cleanse the skin, or for medical purposes. Neutral soaps have been manufactured which not only have no free alkali, but have even a surplus of fat, such as olive oil in their makeup. These superfatted soaps are absolutely emollient instead of irritating to the skin, and they make excellent vehicles for various medicaments, such as corrosive sublimate, resorcin, sulphur and tar. They should be worked into a foam on the affected surface and allowed to dry and remain some time. At night it is a good plan to cover the soaped surface with oiled silk. These soaps may often be used where not even the mildest pastes or salves will be borne, and in addition to this they are cheap. But to be sure, their action is at best only superficial, and preparatory to more vigorous treatment.

In these days of electric machines and appliances it would indeed be strange if dermatology did not avail itself of the subtle current. To be sure, electricity has not been used for so many kinds of purposes in this field as in general medicine, but there are some well defined indications for its use. One of these is hypertrichosis, and the other method for the removal of hair is as follows: A sponge electrode is attached to the positive pole of a galvanic battery, and a very fine steel needle in a pencillike needle holder forms the negative electrode; the current required is about two or three milliamperes, though this varies greatly for different patients, and must be determined by the reaction in each individual case. The current being turned on, the fine needle is carefully introduced into the hair-follicle in the direction of growth of the hair, slipping in very easily when the operation is properly done; then the sponge electrode is grasped in the patient's hand, completing the circuit; a succession of quite unpleasant jerky sensations is felt by the patient, and in the course of twenty seconds or half a minute there appears at the point of introduction of the needle a little foam, showing that the object is attained. After this the hair will come out with the very slightest traction, and will never grow again. The battery used is a matter of choice, my own selection being a chloride of silver dry cell battery of twenty-four elements,

which is very compact and portable. This same method of electrolysis makes by far the most satisfactory way of treating warts, moles, and vascular naevi, most surprising results being often obtained in the last mentioned class of cases. A modification of this process is also very successful in tinea capitis and favus. Here both electrodes are sponge, and the negative one for use on the scalp is wet in some antiparasitic solution such as corrosive sublimate, which penetrates to the bottom of the hair follicles under the influence of the current.

One would naturally think that electrolysis might be employed with equally good results in epithelioma, rodent ulcer, and the like, but it has been found necessary in these cases to anesthetize the patient and use a current of much greater strength.

When Brown Sequard published his theory that the testicle is the secret of robust health he probably never imagined to the treatment of what diseases his statement would be applied. Within a few months, I find that a distinguished French writer has been treating a series of cases of ringworm of the scalp by the internal administration of testicular extract, acting on the theory that as ringworm practically never occurs on the adult scalp, and indeed generally dies out as puberty is established, if an artificial puberty could be brought about by the exhibition of testicular extract, the disease ought to disappear of itself without any local treatment. He claims good results, but the theory is so highly improbable that his statements need confirmation.

But on a similar principle there has been offered as an excellent treatment for scaly diseases like psoriasis and ichthyosis another animal extract—namely, a preparation of thyroid glands obtained from sheep; what suggested its use was the experience that during its exhibition in cases of myxedema the dry, harsh skin exfoliated and was replaced by normally smooth and moist skin. The thyroid extract has indeed proved itself useful in psoriasis, a good many inveterate cases having been cured with no other treatment. But it is open to the objection that, if used in doses large enough to do any good, it causes an alarming febrile reaction, and prostrates the patient. Moreover, it is by no means invariably successful, and indeed not so commonly as the outward application of chrysarobin. In fact, about the only condition which seems now to call for this method of treatment is

a generalized psoriasis, where the affected surface is so extensive as to preclude the use of any toxic drug like chrysarobin or pyrogallic acid. Such a case is now under treatment with thyroid tablets in the New Haven Hospital.

Tuberculin, proposed by Koch a few years ago as a remedy for lupus and other diseases caused by the tubercle bacillus, has still a good many supporters in its claim to usefulness, even though it has not fulfilled the extravagant expectations of some enthusiasts. Crocker, one of the latest writers, says that it will do one thing that neither medical nor surgical measures have been able to effect, viz: to remove the fibroid thickening which is so often present when lupus affects the lip or other place where there is lax tissue. The hypertrophic scar tissue of lupus may also be flattened down by it, sometimes revealing, as it does so, lupus nodules hitherto concealed. Another use for it is, that after as much lupus tissue as possible has been removed by erasion and the subsequent application of carbolic acid or other similar drug, injections of tuberculin appear to remove some of the lupus tissue which could not be removed from without, and thus assists in securing a larger freedom from recurrence and a larger amount of permanent cure.

While on this general subject of the injection of toxines and animal juices for the cure of disease of the skin, I will just mention the fact that within two or three years quite a number of cases of inoperable sarcomata have been cured by the hypodermatic injection of toxines derived from erysipelas, so that this method is a hopeful last resort. And also the fact that Lassar of Berlin has cured several typical epitheliomata by the hypodermic use of arsenic. But although I saw two of his cases before, during and after treatment, and am sure they were orthodox epitheliomata, I feel certain that they could have been removed with less pain and loss of time by ordinary surgical procedures.

This chronicle of improvements might be greatly lengthened by a description of new drugs which have proved themselves of use, such as aristol, naphthol, tumenol, ichthyol, thiol, alumnol, dermatol, iodol, losophan, europhen and very many others, but my subject was new methods, not new drugs, so I have finished.

# THE MORPHINE HABIT.

J. W. WRIGHT, M.D., BRIDGEPORT.

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For several years it has been my belief that the habit of using morphine and opium has been on the increase in our city, and I have endeavored at various times to induce some of our medical brethren to write a paper upon the subject after a due investigation, but without avail. I have finally taken up the subject myself, and making inquiries among our druggists have been confirmed in my opinion by the same expression on their part that this evil is growing steadily among us, for with but few exceptions they express the same belief.

In order therefore to ascertain to what extent this pernicious habit prevailed, I placed in every drug-store in Bridgeport on the first day of the month of November, 1894, a book for the record of all sales of morphine or opium, after the following manner:

1st. Date of sale.

2d. Age and sex of purchaser.

3d. Whether a druggist or physician.

4th. Form of purchase.

I urged each druggist to give as complete a list as possible for a single month, and promised that the results would be a confidential matter between the druggist and myself, and only the general results of my investigations would be shown. I am glad to state that many and most of the druggists aided me most cordially, and kept a nearly accurate record as indicated. Some were exceedingly careless and negligent in their records, although but one refused absolutely to make any record; which was only expected since he was a physician of another school, who had no sympathy with my endeavor. In four cases I failed to secure a record during the first month; in one place I am sorry to say, because one of our physicians observing this book and seeing some entries, deliberately tore the leaves from the book. In one of these cases a very incomplete record caused me

such evident disgust, that the proprietor promised in alarm to keep an accurate record the following month, with the result of showing an increase fourfold in his sales, and a corresponding increase in the number of purchasers.

I believe, however, that with all my care to obtain accurate results, the amount of morphine and opium actually sold fell far within the recorded sales. The proprietor of one of the largest drug-stores in the city, stated that he sold one and one-half pounds of morphine, one thousand morphine pills, five gallons of laudanum, and three gallons of paregoric monthly; and yet the record of his sales as recorded indicate the actual sale of morphine as eleven drams, laudanum fifteen and one-half pints, and no pills.

To show of how little value this record was, let me state that a comparison of this with a small drug-store on the outskirts of the town, shows a sale in the small store of nearly twelve drams of morphine, four pints laudanum, and two onnces opium.

Another comparison between a drug-store reputed to sell more narcotics than any store in town, with a small store in an out-of-the-way place struggling for existence, whose record I believe was most faithfully kept, shows sales considerably larger in the small store.

In other cases I find some druggists have almost or quite omitted to record sales of paregoric, laudanum and opium, and put down only morphine sales. For instance, two drug-stores in East Bridgeport have totals which sum as follows:

1st. Morphine, 12½ drams, tr. opii., 6½ ounces.
2d. " 4 " " " 34 "

Another druggist in the same neighborhood with a record which is almost correct, records a sale of twenty-six drams of morphine, and one hundred and a half ounces of laudanum.

You could scarcely expect that a drug-store which sells fifteen drams of morphine monthly, would not have a single sale of laudanum, paregoric or opium; yet such a record appears in more than a single instance. You are therefore prepared to believe that the sum total of all the actual sales recorded of morphine, opium and paregoric, make a sum total far below the actual amount sold. Having reduced each sale to the actual amount of morphine purchased, I have found the sum total of

the records from twenty-nine drug-stores in the City of Bridgeport during a single month, as follows:

Morphine, two hundred and ninety-six drams, fifty-nine grains (thirty-seven ounces); Tr. opii., sixty-four pints, five and a half ounces; Opium, fifty-eight ounces, one and a half drams, or in round numbers the annual sale of three thousand five hundred and sixty-four drams of morphine, seven hundred and seventy-two pints of laudanum, and six hundred and ninety-seven ounces of opium.

I would like to ask any fair-minded physician if he considers that amount a legitimate use of morphine for this city. Almost enough to supply every man, woman and child in the City of Bridgeport with one-eighth grain daily. Add to this amount, which is the minimum quantity sold as shown by the records, the quantity not recorded through mistake, oversight and neglect; add to this the amount sold in compounds not recorded at all; add to this the amount sold on physicians' prescriptions, and you have a sum total which far surpasses this sum.

Is it not about time to sound a warning? Have we not played with a hidden fire too long? But I have not stated all my facts yet. By a careful estimate and comparison of the records obtained, I find that there are two hundred and sixty-two persons (one hundred and eleven male and one hundred and fifty-one female,) addicted to the use of morphine or opium in this city *to-day*.

A steamer in mid-ocean is lost with all on board, and a wail of anguish rises in both Continents. A ship load is slowly sinking into the waters of oblivion in this city to-day, and not the feeblest cry of pity is heard.

The olden tale of Ulysses who, while sailing along the coasts of Lybia and landing on the shores of the Lotophagi, from whence he could scarcely persuade his followers to leave because having once tasted the lotus (possibly this same poppy blossom), they no longer remembered home and friends, is paralleled, for to-day our neighbors and friends, tasting the poppy sweets, are sinking to forgetfulness of their surroundings; their strong young arms and brilliant minds drooping and idle, lost to themselves and their friends, but not cognizant of it.

The world is lost to them and they care not; the precious

moments of opportunity are pressing and they know it not; and yet no strong arm of Ulysses is thrown out to drag them from this fatal spot.

Would you like to hear some of the details of my investigations? A mother suffers from a fibroid, and becomes a partaker of morphine as a solace to her woes. The comfort she feels leads her to administer some of the same drug to her husband, who complains of some temporary ailment. As the days slip by it becomes the household panacea for all ailments, and to-day a respectable family in the West End is addicted to a habit which is ruining their health, wealth, and happiness.

A young woman of thirty-five, of good family, intelligent, is forgetting life's duties and ruining her health with morphine tablets, at the rate of forty half grain tablets daily. A young man of twenty-five obtains a prescription from a physician for some pain, of morphine pills one-sixth grain, and renews it from day to day.

To-day the pitiful wreck of a once powerful man can be seen tottering along the streets of Bridgeport, ruined in body, ruined in mind, ruined in wealth, because of the fatal hypodermic administered for the relief of a mistaken malady; and not only ruined himself, but ruining others, because in his downfall he drags down to the same destruction his wife, once a bright and charming woman.

I have premised that the purchasers of morphine and opium have also been users of the same, which I consider usually to be true. I have therefore taken the ages of the purchasers from one of our leading drug stores, which are as follows:

Male—Thirty-five, thirty, thirty-two, twenty-five, twenty-four, thirty-six, twenty-eight, fifty, sixty, forty.

Female—Fifty-five, fifty, twenty-five, twelve, thirty-five, thirty, forty, twenty, thirty-five, forty-five, twenty-two, thirty-two, twenty-three, thirty-two.

The ages of these purchasers indicate to us that it is not among the old and decrepid, but among those of youth and middle age that we find the largest purchasers of morphine. Let me give you the maximum daily doses as shown by the records:

A female of forty, two ounces of laudanum; a female of forty-

five, one dozen one-quarter morphine pills; a female of fifty-five, a dram of morphine; a female of thirty takes sixteen grains of morphine on a physician's prescription, daily repeated; a female of thirty, an ounce of laudanum; a female of fifty, two ounces of Majendie's solution; a male of fifty takes twenty morphine pills, one-quarter grain; a female of thirty-five, one hundred one-half grain tablet triturates; a female of thirty, fourteen grains of Tully's powder (this is the only record of a compound of morphine being made); a female of forty-five, twenty grains; a female of thirty-five, one-half dram. The oldest morphinomaniac on record is eighty-four years old.

I think I have shown you pretty conclusively from the records which I have read, that the habit of taking morphine is not only prevalent in this city, hut prohahly much larger than you had supposed. What I have stated regarding this city is prohahly true of others as well. An editorial in the Medical Record of September 20th, '84, says: "Morphinomia has been growing so rapidly and withal so quietly in our country, that its present proportions are hardly realized, even by the profession."

And from the Encyclopedia Britannica, Vol. IV, p. 586: "It is evident that the use of opium as a stimulant is increasing in the United States." Dr. Wiuslow Anderson, of San Francisco, writes to the Medical Record on Nov. 5th, '87· "On this far Western slope of civilization, where people are in a constant state of excitement from speculation, opium smoking and morphine eating are alarmingly prevaleut. Women as well as men are the slaves of the habit."

It is probable that in other countries beside our own, the morphine habit is prevalent, hut I have heen unahle to find any records of the facts except in France and in China. In the Medical Record of June 3d, 1893, M. Duhut de Leferet estimates the numher of morphinomaniacs in Paris to be one hundred thousand. According to this extraordinary statement, every tenth adult is a victim to the morphine habit.

In the Medical Record of Octoher 14th, '93: "Some statistics as to the prevalence of morphinomania in France, recently puhlished hy M. Lacassagne, show that the destructive hahit finds a large proportion of its victims among memhers of the medical profession. Of five hundred and forty-five morphinomaniacs as

to whom he was able to procure information, two hundred and eighty-nine were doctors.

"It is well known that several of the many distinguished men of the profession in Germany, who have died in recent years, were devotees of the fatal drug."

The purposes of this paper would not be complete without dwelling upon the causes for the formation of the morphine habit, and the methods for its prevention. One of the most prolific causes is that of suggestion. Several samples of this sort have fallen under my observation, for example: a young woman suffering from a headache is told by a neighbor to take a morphine pill, a remedy which she has tried successfully for herself for the same complaint. She takes the remedy with relief to the headache, and charmed with its effect, repeats the same during a subsequent attack. Constant repetition increases the number of habitues by one more. I have already referred previously to a whole family who have become morphine takers through the example of a single member. This is not a solitary case, for in my own experience I have met with several of the same kind.

A second cause is the repetition of medical prescriptions. Repeated examples of this kind are shown in the records I have obtained through the druggists. Prescriptions calling for morphine or opium alone ought never to be repeated without permission of the physician.

A clerk in one of our drug-stores informs me that one physician in Bridgeport, uniformly prescribes a cough mixture containing four grains of morphine in a four ounce mixture.

The methods which should be used to prevent an extension of this habit should be seriously considered by members of our profession. One of the first provisions for its prevention should be through the laws; a second through dissemination of a knowledge of the methods by which the opium habits are induced and of the serious character of the affection, through the popular journals.

At the present time there is nothing to prevent any person, who so chooses, from procuring any amount of any kind of poisonous drugs from an apothecary. Most of the druggists consulted were of the opinion that the laws regarding the sale of

narcotics should be more stringent in this State. In New York every person purchasing morphine or opium must do so in the presence of a witness, after recording the name, age and sex. In Massachusetts the Commissioners of Pharmacy have printed a set of poison labels, uniform, for the use of the druggists in that State, samples of which I here show you, through the kindness of Henry A. Hitch, pharmacist for E. H. Hurd.

POISON.

**ARSENIC.**

ANTIDOTE.

Milk; Gruel; Oil; Lime Water; Starch and Water; Dialysed Iron.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**MORPHIA.**

ANTIDOTE.

Keep patient in motion; Cold water to head and shoulders; Galvanism; Vegetable Astringents; Belladonna; Active stimulation.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Fluid Extract Cotton Root.**

ANTIDOTE.

Mustard Water: Strong Coffee; Diluted Vinegar; Chlorine Water.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Cyanide of Potassium.**

ANTIDOTE.

Atropine: Chlorine Water: Ammonia Water largely diluted.

WM. P. DRAPER. Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON

**Oil Pennyroyal.**

ANTIDOTE.

Mustard Water; Strong Coffee; Animal Charcoal; Tannic Acid.

WM. P. DRAPER, Pharmaceutist.
Haynes' Hotel, Springfield, Mass.

POISON.

**Tincture of Nux Vomica.**

ANTIDOTE.

Mustard Water; Stomach Pump; Albumen; Tea and Coffee.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Chloral Hydrate.**

ANTIDOTE.

Keep patient in motion; Cold Water to head and shoulders; Galvanism; Vegetable Astringents; Belladonna; Active stimulation.

Wm. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Tincture of Digitalis.**

ANTIDOTE.

Keep in horizontal position; Tea; Coffee; Stimulants; Albumen; Tannin; Aconite; Nitrite of Amyl; Nitro-Glycerine.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Corrosive Sublimate.**

ANTIDOTE.

Mustard Water; Stomach Pump; Albumen; Tea and Coffee.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Fowler's Solution.**

ANTIDOTE.

Milk; gruel; lime water; oil; starch and water; ferric salts; later alcoholic stimulants.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON

**Parsons' Vermin Exterminator.**

ANTIDOTE.

Mustard Water; Crude Spirits; Turpentine; Sulphate of Copper; Epsom Salts.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Rough on Rats.**

ANTIDOTE.

Milk; Gruel; Oil; Lime Water; Starch and Water; Dialysed Iron.

WM. P. DRAPER, Pharmaceutist.
Haynes' Hotel, Springfield, Mass.

LAUDANUM.

POISON.

ANTIDOTE.

Evacuate Stomach; Strong Tea; Cold Water to Head and Shoulders; Astringents; Atropin, Belladonna or Caffein; Stimulants; Artificial Respiration.

W. P. DRAPER, Springfield, Mass.

POISON.

**McMunn's Elixir.**

ANTIDOTE.

Keep patient in motion; Cold Water to head and shoulders; Galvanism; Vegetable Astringents; Belladonna; Active stimulation.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Fluid Extract Ergot.**

ANTIDOTE.

Mustard Water; Strong Coffee; Diluted Vinegar; Chlorine Water.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON

**Strychnia.**

ANTIDOTE.

Mustard Water; Stomach Pump Albumen; Tea and Coffee.

WM P. DRAPER, Pharmaceutist,
Haynes' Hotel. Springfield, Mass.

POISON.

**OPIUM.**

ANTIDOTE.

Keep patient in motion; Cold water to head and shoulders; Galvanism; Vegetable Astringents; Belladonna; Active stimulation.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

POISON.

**Tincture of Aconite.**

ANTIDOTE.

Animal Charcoal · Stimulants, by mouth and rectum; Warmth; Friction; Vegetable Astringents; Galvanism; recumbent position.

WM. P. DRAPER, Pharmaceutist,
Haynes' Hotel, Springfield, Mass.

In this State the only restriction placed upon the sale of morphine or opium is that there shall be affixed to the package the word "poison," with the penalty of the enormous sum of one dollar for violating the provision of this section.

In order that you may see how lax the law of our State is, compared with other States, I have had copies made of the laws of Connecticut, Massachusetts and New York, which I hope you will pardon me if I read as hastily as possible, for the reading of laws is a tedious and sleepy addition to any paper.

"The Paris correspondent of the Tribune in a recent letter, wrote that he had just come from a lecture on 'Morphine Mania,' by Dr. Durand Fardel. The lecturer spoke of this kind of intoxication as having stolen first on the wealthy, and now as spreading so fast to the less rich classes, as to threaten to bring France to the level of China and Turkey.

"He showed a hypodermic, which was really an article of jewelry. One end was a pencil to note down dance engagements on ivory tablets, and the other end a hypodermic. The case was enriched with brilliants, and the tablets were attached to a ring, jewelled also, which was to be worn on the finger of the person intending to use the instrument. He found in many instances that the initiation began at social meetings, when a select company gathered to make experiments and to relate sensations."—Medical Record, Vol. 41, P. 445.

It is probable that the people of China are the largest opium eaters in the world, for it is stated in the Medical Record, Vol. 38, p. 300, that "The total annual home consumption in China has lately been reckoned to be about forty-one million eight hundred thousand pounds."

"There are said to be twenty-five million opium smokers in China, and the number of deaths directly attributed to the effects of this poison, reaches one hundred thousand annually."

Medical Record, Nov. 16th, '89, Vol. 36, p. 560.

GENERAL STATUTES OF CONNECTICUT.

Sec. 3130. "Every person who shall sell arsenic, strychnine, corrosive sublimate, prussic acid, cyanide of potassium, or paris green, or who shall sell rat dynamite, rough on rats, or any like article containing arsenic, strychnine, or corrosive sublimate,

shall affix to the package sold by him a label plainly marked with his name, date of sale, and the word 'poison,' and shall enter on a book kept by him for that purpose, the name of the purchaser, date of sale, and the quantity sold; which book shall be kept open for public inspection, carefully preserved, and when he shall close his business or remove from the town in which such business is carried on, or when said book shall be filled with such entries, it shall be deposited by him in the office of the town clerk of the town in which he may conduct his business; and any person who shall violate the preceding provisions of this section, or who when purchasiug any of the articles herein named shall give a false or fictitious name to the vender thereof, shall be fined not less than ten nor more than one hundred dollars."

Sec. 3131. "Any person who shall sell any of the articles named in the schedulc accompanying this section, marked Schedule A, except when prescribed by a practicing physician, or sold at wholesale to licensed pharmacists, or for use in manufactures or the arts, shall label the bottle, box, or wrapper containing any such article, with a label upon which shall be plainly written or printed the word 'poison,' and any person violating the provisions of this section shall be fined one dollar."

Schedule A.

"Acid carbolic, ammoniated mercury, acid muriatic, chloroform, acid nitric, tinct. aconite, acid sulphuric, tinct. belladonna, acid oxalic, tinct. digitalis, creosote, tinct. opium, extract belladonna, tinct. veratrum viride, sugar of lead, morphine, croton oil, nux vomica, cobalt, extract nux vomica, oil bitter almonds, opium, oil tansy, cocculus indicus, aqua ammonia, red oxide mercury, gelseminum."

Let me add (in parenthesis), that the poison book is so little used in our drug-store, that it was with considerable difficulty resurrected at my requests, and the dates were of ancient history.

## PUBLIC STATUTES OF MASSACHUSETTS.

Act Regulating Sale and Purchase of Poisons.

"Whoever sells arsenic, atropia, or any of its salts, chloral

hydrate, chloroform, cotton root and its fluid extract, corrosive sublimate, cyanide of potassium, Donovan's solution, ergot and its fluid extract, Fowler's solution, laudanum, McMunn's elixir, morphia or any of its salts, oil of pennyroyal, oil of savin, oil of tansy, opium, paris green, Parson's vermin exterminator, phosphorus, prussic acid, 'rough on rats,' strychnia or any of its salts, tartar emetic, tincture of aconite, tincture of belladonna, tincture digitalis, tincture nux vomica, tincture veratrum viride, without the written prescription of a physician, shall keep a record of such sale, the name and amount of such article sold, and the name and residence of the person or persons to whom it was delivered; which record shall be made before the article is delivered, and shall at all times be open to inspection by the officers of the district police, and by the police authorities and officers of cities and towns.

"Whoever neglects to keep or refuses to show to said officers such records, shall be punished by a fine not exceeding fifty dollars.

"Whoever sells any of the poisonous articles named in the section, without the written prescription of a physician, shall affix to the bottle, box or wrapper containing the article sold, a label of red paper upon which shall be printed in large black letters the word 'poison,' and also the word 'antidote' and the name and place of the vendor. The name of an antidote, if there be any, for the poison sold, shall also be on the label.

"Every neglect to affix such label to such poisonous article before the delivery thereof to the purchaser, shall be punished by a fine not exceeding fifty dollars. Whoever purchases poisons as aforesaid and gives a false or fictitious name to the vendor, shall be punished by a fine not exceeding fifty dollars; provided that nothing in the act shall be construed to apply to wholesale dealers, and to manufacturing chemists in their sales to the retail trade."

## STATUTE LAWS OF NEW YORK.

### Drugs and Druggists.

Sec. 20. "An apothecary or druggist, or a person employed as clerk or salesman by an apothecary or druggist, or otherwise carrying on business as a dealer in drugs or medicines, who sells

or gives any poison or poisonous substance, without first recording in a book to be kept for that purpose, the name and residence of the person receiving such poison, together with the kind and quantity of such poison received, and the name and residence of some person known to such dealer as a witness to the transaction, except upon the written prescription of some practicing physician whose name is attached to the order, is guilty of a misdemeanor."

LABELLING POISONS AND OPIATES.

SEC. 22. "A person who sells, gives away or disposes of any poison or poisonous substance, (except upon the order or prescription of a regularly authorized practicing physician,) without attaching to the vial, box or parcel containing such poisonous substance, a label with the name and residence of such person, the word 'poison' and the name of such poison all written or printed thereon in plain and legible characters; and a person who after the first day of January, 1887, sells, gives away or disposes of or offers for sale, any sulphate or other preparation of opium or morphine, except paregoric or those preparations containing two grains or less of opium or morphine to the ounce, without attaching to the bottle, vial, box or package containing such sulphate or other preparation of opium or morphine, a scarlet label lettered in white letters, plainly naming the contents thereof, with the name and residence of such person, is guilty of a misdemeanor."

MORPHINE.

1. "From and after the passage of this act, no pharmacist, druggist, apothecary or other person, shall re-fill more than once prescriptions containing morphine or opium or preparations of either, in which the dose of opium shall exceed one-quarter grain, or morphine one-twentieth grain, except with the verbal or written order of a physician."

In conclusion let me add, that it is not my purpose to prevent the numbers, now habitual users of this drug, from pursuing their downward way, for the habit is a most seductive one and few can withstand its temptations; but it is in the hope that I may enlist your coöperation in the prevention of an evil which has, alas, engulfed so many of our own fraternity.

Let it be said in our praise, that medical men have always been ready to further any means to prevent the spread of disease, and hinder the progress of contagion at whatever personal sacrifice. But the appeal comes now in a different way and at a greater sacrifice, for after all we are men, and the wail of suffering humanity appealing for relief from actual pain, is hard to bear, and it is difficult to hold the hand for a future good, when the present relief and comfort lies within our hand.

Realizing the danger, we can use our friend the enemy with greater caution, and by preventing its indiscriminate use through wise laws and goodly counsel, do much to counteract an evil tendency.

Among the ancient Greeks it was the custom after a tragedy had been played to enact a comedy, which would relieve their depressed spirits and send them from the theatre in a more cheerful frame of mind. In like manner let me play the ancient Greek, and relieve the tediousness of the subject and paper, by a little story gathered during my search for items of interest in connection with this paper, and in a manner relevant to it, from the Medical Record, Vol. 27, P. 222, Feb. 21st, '85.

A case illustrating the treatment of opium poisoning. A true story related by W. T. Parker, Atlantic City, N. J.

"Among the students residing with Dr. H., of Dublin, was a young man who had received a very severe wound to his tender emotions in an affaire du coeur. One morning he was absent from the breakfast-table, and as he had shown symptoms of indisposition for several days, a student was sent to his room to inquire into the matter. It was found that the young man had been taking laudanum, for a small bottle labeled 'Tr. Opii,' and nearly emptied was on the table by his bed, and deep sleep seemed to have overcome the victim of a woman's treachery.

"Hastening down to Dr. H., the student informed him of the dangerous condition of his medical brother upstairs. The doctor did not seem inclined to hasten, however, but to the amazement of his scholars, went to a little closet and brought out a stout rawhide. Ordering a cup of coffee and some emetics, he proceeded to the chamber of the supposed suicide. The rawhide was concealed. A good emetic was given, and afterward some strong coffee.

" 'Gentlemen,' said Dr. H., 'we have here a very interesting case of attempted poisoning by laudanum. The emetic which I have administered has happily proved successful, and the patient has received a cup of strong coffee. He still remains in a drowsy, sleepy condition, and this, gentlemen, as you are well aware, is of the greatest danger.

" 'Out of this sleepy state he *must* be aroused, and he must be kept clear from it.' So saying, the doctor pulled down the bedclothes, exposing the strong limbs of the youthful Esculapius. Whack went the rawhide well across them at the same moment, skillfully applied by the patient's preceptor. Again the whip descended and the poor student, smarting with pain, sprang from the bed and tried to escape. The strong arm of the doctor secured him, and the rawhide continued its cruel work. 'Stop, in mercy stop!' cried the miserable youth.

" 'Gentlemen,' said Dr. H., 'in cases of this kind it is your duty to keep the patient awake, and to endeavor to save his life. If you are hindered in your efforts by any false ideas of pity, or over sympathy, you wrong your patient, and must be responsible for the consequences.' Down came the rawhide again, and smarting with pain, the poor victim howled for mercy.

" 'Gentlemen,' said the doctor, 'let this be a good lesson; never give up a case of opium poisoning. As long as the patient is awake there is hope, and you must keep him awake.' Again the hide descended and again, until at last the poor fellow protested that he had only taken a drop or two to make him sleepy, and that it was all a pretense.

" 'Gentlemen, never be influenced by the cunning of would-be-suicides, who strive in every way to deceive, in order to make their dreadful attempts successful.' Down came the rawhide again, and the poor sufferer began to think the misery never would cease. With a farewell cut the doctor let him creep into bed again.

" 'Gentlemen, I think we can now leave our patient with safety to himself,' and turning to the sobbing student he said, 'If you ever really wish to terminate your life, which God forbid, go to some lonely place and do it, and keep your fellow mortals free from the agonizing suspense.' "

# THE INEBRIETY OF INSANITY FROM A MEDICOLEGAL POINT OF VIEW.

BY T. D. CROTHERS, M.D., HARTFORD, CONN.

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Insanity is a general term used to designate disease of the brain, and includes a great variety of degenerative processes. Inebriety is one of these degenerations, and is often preëminent, as an insanity, and not only developes insanity, but masks and conceals it. Insanity is a full developed, organized stage of dissolution. Inebriety is another phase of the same condition, only more obscure and complex. Both are interchangeable and alternating, and both follow fixed lines of degenerative march.

In a certain number of cases, the inebriety conceals the real condition, as in general paralysis. Here the drinking will appear suddenly, and be explained and justified as the result of certain circumstances, first appearing in moderation, and regularly every day, then in excess at night, at intervals, then finally to excess every day. Associated with this is intense egotism and general exhilaration. These cases are taken to asylums and the spirits removed, when advanced stages of general paralysis appear. The inebriety was a symptom, and also an exciting cause. During this stage of spirit drinking, masked deliriums of an elevated nature appear. Changes of conduct and character are common. A miserly, sordid man began to drink and became very generous. He gave away a large amount of property in a strange, unreasoning way, and died suddenly, leaving a will that was contested.

B., after forty years of temperate, exemplary living as a quiet country lawyer, began to use spirits as a food, and warmly defended its value. Soon after he became involved in projects to sell counterfeit money, and later was arrested and sent to prison. When the spirits were withdrawn, general paralysis appeared, and he finally died in prison, the true nature of the case being unrecognized.

C., a manufacturer, a careful, prudent, business man, a total abstainer, of excellent reputation and a leader in the community, began at the death of his wife to use spirits daily. He defended his course rationally and frankly. Later he drank to stupor at night, became reckless in his business, associated with fast women and committed bigamy. Finally, he was arrested as an accessory to murder by poisoning. General paralysis appeared, and he died in an insane hospital. Twice his family made legal efforts to have his mental condition examined, but the medical testimony failed to recognize anything beyond his inebriety.

D., a mechanic, previously temperate, began to drink excessively every night. A year later he was arrested for forgery and assault, and two years after he died of general paralysis, in prison.

These cases outline a class whose crimes are strange and unreasonable, persons whose previous character gave no indication of this ending. The use of spirits was strange and unusual, and the changes of conduct and character were overlooked. Delusions of strength and general exhilaration of the mind, with intense activity, frequently appear to the unthinking, not as disease, but rather evidence of good health, while imprudent acts and altered conduct are considered transitory, and due to spirits alone.

Another class of these cases has symptoms more confusing. They usually begin the use of spirits after some illness, or shock, or injury, and drink excessively, developing delusions of persecution and neglect, with intense suspicions of those nearest to them. Suddenly crime is committed, or strange wills made, or dishonest papers executed. Then comes the question of mental soundness, and the fact of the free use of spirits is accepted as evidence of a voluntary willful state, which, legally, is supposed to increase the measure of responsibility. The altered character and conduct, and the unreasonable acts in question, are not studied from a physical side. The man is executed or placed in prison. Later, muscular tremors, delirium, depression or exaltation come on. If depression, it takes on a religious form, with confessions, repentance, and intense desire to repair the wrong, or to become a light-house of warning to others.

Often the confessions are delirinms of extravagant statements, based on a few facts and untrue in detail. If the punishment is death, these statements are, in many cases, morbid exaggerations of their own acts and motives in the crime. If exhilaration follows, bravado, and donbts of the execution of the sentence is prominent; denials of the crime, with indifference and exalted confidence and satisfaction in his power to overcome the present situation. Both of these states finally merge into paralysis, with dementia and death. If the death penalty follows early in the case these extreme stages may not appear. If long imprisonment, the record of insanity and death in an insane asylum or prison hospital is the common end. After trial and sentence, these cases are lost to public interest. Bnt confinement in prison reveals their trne condition.

Another class of insanities is preceded by inebriety, and hence concealed and unknown. They are the various forms of progressive degeneration called "Dementias." There is a slowly increasing failure of all the intellectual and moral facnlties, a dnlling and weakening of the mental and emotional activities. This is not idiocy or stupor, but profound or partial failure of the entire organism.

In many of these cases inebriety is a prominent, early symptom, and crime, law-breaking and wrongs are not infreqnent. There are some distinct forms of dementia that are prominent in legal cases. One class, called senile dementia, is pecnliar to old age, or exhanstion in middle life. The following are illustrative cases:

A., a merchant, who at fifty had acquired a fortnne, was a temperate, model man in his community. Withont explanation he began to nse large quantities of wine at night. Later he used stronger spirits, and although not intoxicated, was constantly under the influence of alcohol. His habits and character changed, and a year later, as president of a bank, he was found guilty of forgery and malfeasance. The defense of inebriety was considered irrational, and two years later he died in prison of dementia.

B., a very exemplary clergyman, began to drink spirits to excess at sixty years of age. He became involved in a social scandal and forgery and was sent two years to prison. The evident

insanity of the crime and the man was urged at the trial, but was not recognized. Eight months later he died of exhaustion and dementia in the prison hospital.

These cases are examples of a large class who begin to use spirits to excess in the middle or advanced periods of life. Finally they become involved in some crime, usually of an aggravated character, against property or person. After conviction and confinement the real condition appears.

Another class of these cases is noted in persons from twenty to forty years of age, who suddenly become inebriates and commit crime, and die of dementia. The dementia is due to heredity, or the premature exhaustion of the brain and nervous system.

A., at twenty-five began to drink to excess, and two years later was convicted of manslaughter and died a year after in prison of dementia. He came from a degenerate family, who all died early in life from various exhaustive diseases. He graduated at fifteen as a prize student, and was a brilliant lawyer of great promise at twenty. The inebriety at twenty-five was a symptom of premature age, exhaustion and dementia.

B., after ten years of intense mental activity in business, became an inebriate and a criminal at the age of twenty-eight. He died in prison at twenty-nine, of dementia. In this case, dementia and exhaustion were due to overwork, and inebriety and criminality were only symptoms.

C., at thirty-one years, began to drink and consort with low persons, and later was convicted of bold, unreasoning forgeries. He died of consumption and dementia in prison. In this case, a long period of excessive overwork and mental strain resulted in inebriety and criminality, and death.

In these cases, the decisions of the court were based entirely on the crime, and the fact of inebriety, associated with it, was regarded as an aggravation and evidence of willfulness.

Many of these cases have marked symptoms of mental changes, such as lack of former activity and precision, loss of pride, honor, and ambition, changes in their manners and conduct, talk and expressions, either apathetic or excited. The usual progressive stages of dementia are hurried along in a confused medley of symptoms that become more complex as the

palsy from alcohol deepens. But the original cause is seldom concealed, and always apparent from careful study.

A third class of cases comes under legal notice where the inebriety is an initial symptom. They are the slow, progressive, systemized insanities, that after a long initial period develop into some particular form of mania, delirium and delusion. They are termed insanities of involution, and are literally the progressive tearing down of the brain citadel, and breaking up of the processes of control and adjustment.

Some of these cases become inebriates, and after a variable drink period abstain, and show symptoms of distinct forms of insanity. Many of these cases have been described as alcoholic insanity, while in fact, the use of spirits was only a symptom, and not an active cause. The insanity, undoubtedly, comes from some fault of the organism, such as cell and brain starvation, exhaustion, and poisoning.

The derangement of functional activities is manifest in physical pain and suffering, and alcohol is a most fascinating narcotic. Later, the narcotism of spirits becomes painful and repelling and is given up, and the real condition appears.

The use of spirits in these cases is not so impulsive, or imperative as in paresis or dementia, and appears to be more under the control of the will. The pledge, the prayer, the threat, short punishment in jails, each has a deterring power, but only for short, variable intervals. Crimes and lawbreaking are common, and seem to start from sudden, dominant ideas that seize and possess the mind to the exclusion of all other considerations. The various manias and phobias describe the dominant thought of the impulse, which leads to crime. These mental states are awakened and roused to activity by the action of alcohol. A man, previous to drinking may have had a thought of the possible unfaithfulness of his wife, or the dishonesty of his friends or associates, or the persecution and jealousy of others; or some special fear of possible disaster in the future from certain causes. Later, when he becomes an inebriate, these morbid thoughts which were at the beginning (hints of brain defects), but were controlled, now become fixed and settled convictions. In the sober moments they may be suppressed and concealed, but when spirits are used, they come into full activity.

Crime in these states may show deliberation, cunning, and premeditation, and even acute reasoning as to the effects and consequences of the act.

A, an inebriate thirty-four years of age, whose inebriety was of four years' duration, set fire to a rival's store, at a time and in circumstances that manifested shrewd cunning and calculation of the effects. Loss of life and a large amount of property followed. The cunning of the act and of his concealment was revealed when he became sober. He was sentenced for life, and a year after he became a chronic maniac with delusions of persecutions.

B, whose inebriety was of two years' duration, shot his father-in-law, without apparent motive, and with premeditation and studied reasoning to conceal his personal identity. He was sentenced to be hung, and before the execution, developed mania and died in an insane asylum a year later. In both of these cases, the act was, no doubt, the development of a thought occurring previously and restrained for the time, finally, it became an obsession that dominated every other impulse.

Persons of this class convicted of crime have uncertain conceptions of both the act and the motive which impelled it. Confessions which are minute as to details and reasonings concerning the crime are unreliable, and should never be considered of value as testimony unless sustained by other and confirmatory facts. Delusional confessions and hysterical statements implicating himself and others, have often been accepted as evidence to the great injustice of innocent persons. In a number of instances, such confessions have been found to be false; and inebriates of this class have accused themselves of crime which they never committed, and been punished by death for it. The same is true of all statements implicating others. When the anesthetic action of alcohol has passed away, or the man becomes partially sober, a state of bewilderment follows, and his memory of the crime and the motives are hazy and uncertain. At this time, a newspaper account of the act, or the statement of his friends, or some zealous officer of the law, or reporter, may suggest a motive, or range of details of the crime which, after hearing them once, he accepts as true without question. The brain

in such cases is incapable of forming clear conceptions of acts, or realizing the purpose and motives that predominated.

All such cases should be placed under expert medical observation for a year or more, and no statements of the crime be used against them or personal confession be considered as evidence excepting in confirmation of other facts.

Strange, unusual wills, fraudulent contracts and papers, by persons who are recognized as inebriates, should be critically studied—first the author and then the act. The first inquiry should be of the onset and history of the drink period, and the evident changes which have been observed during this time. Then going back to the history anterior to the use of spirits, including the heredity disease and injuries, culture, nutrition, and growth. Every fact which has a bearing on the mental and physical health of the man must be noted by this inquiry. If this study is exhaustive the actual condition of the case will appear. The act and its motives, the conditions which preceded it, and the surroundings are all important facts from which to form a correct estimate of the man and the act. Most of these cases show a continuous chain of cause and effect either from inheritance or disease, marked by changes of conduct and thought before spirits were used, and marked deviations afterwards.

Where a history of sun or heat-stroke, or injury causing unconsciousness, or severe fever with delirium appears before spirits are used, then inebriety and crime, there is a reasonable expectation of insanity. It may not be of a marked type, and may vary from the forms described in the text-book, but it will have all the essential elements of insanity.

In a case of bigamy, where inebriety had come on suddenly, and irregularities of conduct followed, I found an extreme state of irritation and wild, strange anger, that was continuous for months before. He had been in jail three months awaiting trial, and had no spirits and nearly all his waking hours were spent in passionate denunciation of others.

A clergyman of quiet, amiable disposition, was treated under my care for inebriety, and recovered. Soon after, he displayed a most violent, unreasonable temper in little things, and committed assaults on his wife and family. This became very serious, and fortunately he died before any crime was committed.

Both of these cases were insane, and both manifested extreme changes of temper, that would have led up to crime with absolute certainty.

In another case under my care, the removal of spirits was followed by delusions of death from poisoning by his family. In no other particular did he show mental weakness. This delusion grew to a serious magnitude and became threatening. He made a will, ignoring his family; finally, he was treated with opium, and became an opium inebriate, and his delusion disappeared. He died two years later, made a new will, and his family relations were re-established. The insanity in this case took on the form of delusions, and would have ended in crime had not opium been given. In a similar case, a soldier who had seen hard service in the late war, was treated in an asylum for inebriety of three years' duration. Soon after he displayed a violent temper which became marked mania from the most trifling causes. He attempted injury on several occasions and was dangerous in his uncontrolled anger. By accident, he became an opium taker and his mania subsided. He lived five years after this time, then died of exhaustion and dementia. Melancholy and noted physical depression, with delusions of health and insane efforts to find some new medicine or means to restore health and perpetuate life, are symptoms in a certain number of cases.

The question in any case which comes into legal notice is the presence of insanity or inebriety. Is the inebriety only a symptom, and insanity the original cause; or, is inebriety the cause and insanity the sequel or result? Whichever condition is prominent, alcohol has injured the brain, disturbed and lessened the sensory nerves, and palsied the centers of perception. The brain is enfeebled and unable to act normally because of false impressions and imperfect power of control.

If the facts of the case indicate some previous change and failure of reason or conduct, and the inebriety is comparatively sudden, it may be considered as a symptom of deeper disturbances. If the inebriety appears after disease, or mental or physical shock, or states of extreme exhaustion, it is clearly a symptom. If inebriety comes on gradually, associated with exhilaration, or unusual depression, grave central brain degenerations are to be expected. If the inebriety is marked by

criminal thoughts and conduct foreign to his previous life, the higher brain centers are breaking down or destroyed. If the inebriety is of three or more years' duration, and has been prominent in frequent intoxications, the insanity is to be inferred, and the possibility of sanity and normal power of reason and control is a fiction, unknown in theory or practical experience.

The history and character of the criminal act, often gives a clear conception of the degenerative brain that executed it. The faults of reasoning and exaggerations and underrating of the results and consequences of acts, with the reckless disregard of others' interests, are clear evidence of brain failure.

The consideration and final adjustment of these cases and their acts, should extend over a sufficiently long period of time to enable the court to be fully acquainted with all the facts at issue.

If in a case of capital crime the person should be under medical observation for a year or more, his real condition would appear. If the act of such persons becomes a question, the same exhaustive study is essential to reach reasonably accurate conclusions.

# THE THERAPEUTIC VALUE OF MOUNTAIN FORESTS.

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Dissertation read before the Hartford County Medical Association.

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In these days of critical analysis, when the interrogation point stands as the antithesis of every theory, and deductions without statistical support are doubted, it may appear presuming to offer anything apart from scientific accuracy and which must, from its very nature, be largely limited to generalization.

There is, however, a relative value in personal observations, although the processes leading to certain declared results may not be fully understood or be capable of analytical expression.

Climate is the product of the mystical workings of a series of component factors, and is not always rightly judged or classified by its predominant feature, whether it be cold or heat, rarity or density, dryness or humidity, sunlight or shade, or any special feature alone, though we may recognize its indication; but we must consider the totality which these elements produce or employ the whole in the light of results, admittedly with empiricism confessed, yet as truth-seekers, until we may in time peep into the crucible and learn the secret of Nature's alchemy.

In the consideration of forestry, from our geographical standpoint, our minds naturally revert to the mountainous timberlands of northern New England and of eastern New York, the pine woods of Maine, the White and Green Mountains, the Adirondacks, the Catskills, and the great timberlands that stretch down the Appalachian chain.

Modifying influences, such as soil, ocean winds, the encroachments of civilization, etc., pertain to some of these that are not common to all and for any reasonable refinement they should be viewed separately and the section which is in its most natural and unmodified state appears to be the Adirondacks.

The habitable part of this great tract is in undulating spaces which are from fifteen hundred to two thousand feet above the

sea, dotted with deep and shallow pure water lakes, drained by rapid running brooks and rivers, sheltered by peaks and ranges from one thousand to three thousand feet higher, and all, uplands and lowlands, robed in a mass of virgin forestry, upon which the woodman's axe has only begun its encroachment, yet with a rapacity that threatens an early modification of its present marked climatic features.

How simple to understand the therapeutic value of a region like this if we had a mass of carefully collated statistics from which to draw our deductions, but the possibility of this aid is opposed by the nature of all the attending circumstances.

One patient, advised or not advised, seeks the conventional hotel; another a tent or a poorly chosen camping site, neither recorded as to their pathological condition and observed only casually by a chance professional attendant. All we may know of result is they improve, recover or die.

This is not true of all, for many go, remain and return under medical advice and observation, but the other class forms so large a percentage that for the present any statistics can but imperfectly contribute to the basis of our conclusions.

There are also many modifying factors to consider; the mountain village has its glaring sun, its wind-swept streets, its dust, its refuse accumulations.

The great hotels have their crowded halls, their indoor ease, noise, ill-ventilated rooms, vitiated air, imperfect drainage, questionable water and ice, and, not least of all, the ptomaine served in most edible form from the hand of the French cook.

All these modify, though they do not, fortunately, nullify the natural curative influences of their location. It is therefore, plain to see that evidences from such surroundings too greatly lack completeness for accurate deductions.

Even in the mountain sanitarium the aggregated cases, forming a more or less crowded contact of patients, introduce detracting factors to the ideal of an aseptic atmosphere, which, Robert Koch declares, is the first essential to a perfect climatic resort. These mountain sanitariums are of unquestioned value and to no one are the limitations more apparent than to those in charge. These cases can be tabulated, studied and classified

and, so far as these observations extend, add to our definite knowledge of mountain air treatment.

Under all the conditions so far alluded to, we must consider the influence of elements dependent on the artificial character of these conditions as plus the initial state of the patient and as modifying the therapeutic value of the resort. Again, we have difficulty in drawing concise conclusions from the isolated cases we find scattered through the forest, in hut, or tent, or cottage, for we have a too limited historical or pathological knowledge of them for comparative study. These cases return to their friends and report a providential cure. The effect upon the laity is that others go unadvised, some to recover, some to die, and upon the profession much unintelligent, haphazard advice.

The one chief virtue of mountain forests is perfect purity of air; we are pleased to talk of ozone without knowing just what part it plays as a component of the climate. Comparative estimates at different elevations show that the percentage of oxygen in air does not materially differ, and that excess of carbonic acid is chiefly found in air vitiated by respiration or in the presence of active decomposition. In a mountain forest at this altitude and latitude neither of these are present. On the contrary, both vegetable growth and vegetable decomposition are comparatively slow, and oxygen and carbonic acid maintain their normal relations with oxygen at its maximum, the result being an aseptic atmosphere.

While the emanations from the southern pines may have antiseptic properties (and of this I am somewhat skeptical), it hardly seems probable that this credit belongs to the pine, spruce and fir mingled with the deciduous trees throughout the forest. It is, of course, agreeable to think of their healing balm, but such hope lurks only in the minds of those who expect the performances of nature to equal those of a proprietary medicine. In the perfect purity of its air a mountain forest like this, therefore, meets the first requirement of a climatic resort.

The elevations found in this mountain group and in neighboring groups is not excessive; here it is just sufficient to yield complete immunity from that atmospheric humidity which marks locations influenced by the sea, and which, to some persons, is so prostrating and enervating; even in tent life there

are none of the inconveniences which are elsewhere due to a saturated atmosphere. While the rarity of the air at two thousand feet above the sea is chiefly credited with this result, there are other contributing factors, and among them the character of the soil and the prevailing winds. The soil is chiefly gravel and a sandy loam, with here and there masses of rock reflecting and retaining the heat. There are only a few clay beds in the counties forming this forest and throughout this whole region is comparatively little soil of a moisture-retaining character. The presence of a large body of water in a mountain lake, with its rocky shores and sandy beaches, differs quite materially, climatically considered, from a heavy, moisture-holding soil. It should not be forgotten that the prevailing winds are southwesterly, and a glance at the forestry map of the United States is sufficient to see how, for nearly five hundred miles, this air passes over an almost continuous mass of foliage unbroken by any considerable opening and uninfluenced by the sea. In such an air the micro-organisms are reduced to a minimum and there can be no dust excepting along the sandy roads and in the villages. Within the forest there is no dust. *The profession does not begin to appreciate this fact* in considering pulmonary treatment.

One of the marked differences between a sea climate and a mountain climate is that the latter is subject to great and more sudden changes of temperature, but there is no question as to the power of an immense forest to hinder the full action of this tendency. When we consider the late Professor Gray's estimate that the Washington elm at Cambridge produced a crop of seven million leaves, exposing a surface of two hundred thousand square feet, or about five acres of foliage, we can begin to estimate the immense value of a primeval forest of over three million acres as an equalizer of temperature. Repeated comparisons have shown five degrees lower summer temperature in a lakeside woodland park than in a large village clearing on the same lake; that is, a shaded, maximum, summer temperature of eighty-seven degrees in the woods means ninety-two degrees in the open. But temperature is not all: this same air has indefinable qualities, perceptible only to experience, a certain sustaining quality that prevents weariness, a sharpness that stimu-

lates the physical and mental faculties, producing an appetite that surprises the dyspeptic aud yet stimulates his digestiou. On the other hand, that soporific quality, so justly claimed for sea air, is also found here. I well recall, as oue of my earliest impressions, a neurasthenic with persistent iusomnia ou Buzzard's Bay, but who, on the second night in a mountaiu cottage, slept soundly and continued thereafter to sleep nightly with day naps thrown in, and, with this, strength and appetite returned.

All mountain regions are subject to storms. Their disagreeableness depends on the wiud. The frequency of an easterly or northeasterly storm very largely determines the value of an eastern climate. Easterly sea winds must pass over or around two ranges of mouutains to reach the Adirondacks, so well are they shut in from sea influence. The prevailing winds are southerly aud westerly, with, now aud then, a uortheast storm of short duration, through which the weather-wise pass without harm and with but slight inconvenience to ladies in well erected tents.

Our attention is chiefly attracted to the summer climate of a mountain resort, but that of the winter is not without its value. The cold is usually iutense, playing np and down the mercurial gamut below the zero point with surprising familiarity, and yet the air is an elixir aud the physical tolerance and endurance are remarkable. This low temperature does not argue against the treatmeut of pnlmonary patients excepting iu two features, the lack of social euvironment and the recollection that a certain percentage of patients cannot endure cold. Still we should not forget that zero near the coast causes more suffering than twenty below in the mountains where the ground is buried in a light, dry snow all through the winter and not nutil the break up in the late spring is there a chill to beware of. Conld April and May be omitted from the year a mountain forest iu this region would be nearer perfection.

In the application of forest therapy, phthisis, chronic malaria and hay fever are the chief diseases to be considered, together with such conditions as neurasthenia, anemia, nervous dyspepsia and insomnia.

The great cry is for the phthisis cure, and even as I write these lines a new one is heralded.

If you will send into these mountains cases that have not passed into the last stage and will place them wisely as to the particular needs of the individual, you may confidently expect good results in a large number of them. Let me suggest the favorable conditions for their environment. First of all, open door life in pure air, free from dust and unsanitary surroundings; next, on a dry, sandy soil or a rocky lakeside; third, not exposed to strong winds, but open to moving currents of air from the south and southwest, protected from the north and exposed to all day sun. Such places are abundant and a little searching will reveal them. It is surprising how many physicians send their patients to California or Colorado or the Adirondacks without any particular or definite advice, apparently forgetting the many unsuitable localities the innocent patient may select in any of these great regions where conditions are almost as various as the peculiarities of patients. We should measure our expectations by the intelligence of our advice. I well recall a case of advanced phthisis located at a roadside inn, miles from the forest and exposed to the unimpeded sweep of a south wind blowing for miles along a dusty road. You will agree that a tent upon the wooded hills of Connecticut would have been as well or better. Men of national reputation have sent patients to the Adirondacks and I have found them in the small, hot rooms of a crowded hotel, beyond any possible help. We should not judge of a value of a remedy by its abuse.

It is, of course, only natural that incipient cases show the most marked improvement, but their progress is a profitable revelation. The first manifestation of improvement is an increased appetite, the energies are stimulated to exercise, and now judicious advice is all important and more especially as this exercise produces so little apparent fatigue.

There appears to be a febrile tendency in this elevated air, especially in unacclimated subjects, and a little exercise in the midday sun may incite a slight rise of temperature, but, wisely preventing this, nutrition goes on and a realization of increased weight gives to the patient's mind an added stimulus. Forest rambles, boating, and later, if prudent, bathing in August may be advised. If your patient has been under the observation of a physician through a summer you can by that time be advised

as to the next step, whether to continue in the mountains, and where, or whether a new climate should be selected. A summer in the Adirondacks proves to be a most excellent testing ground before sending your patient far from home. It is folly to expect gratifying results from cases in which the disease is still active, while they continue to walk the dusty village streets with a daily temperature. Put them in a tent upon their own lawn until the fever has subsided and then give them the best the mountains afford.

Malaria. I can unhesitatingly say that there is no section in the eastern part of the United States so satisfactory in the treatment of malarial fever or malarial cachexia as given localities in this mountain region.

A majority of the patients who are unadvised will often miss the benefit, but those acting under prudent advice will, if no organic change has taken place, recover if a little persistence is practiced, but the noonday sun and the evening air must alike be avoided. These patients are discouraged by a recurrence of a chill and seek a new locality only to have the chill reappear with each change. Continuance in a wisely chosen spot, prudent habits and proper medication will in time work a marked improvement, looking toward a cure. This applies to chronic malaria: recent cases, not progressing well at home, improve immediately after arrival.

Hay fever. It has been my lot to meet many people in the mountains who, elsewhere, had annual attacks of hay fever; here they are totally exempt. I have known them to remain unafflicted all summer at two thousand feet elevation and in the forest, only to begin suffering on descending to one thousand feet, a dusty road, and occasional clearings.

Such conditions as neurasthenia, anemia, nervous dyspepsia, and insomnia are those in which the most gratifying results are seen because yielding so quickly to treatment in this climate, but care must be exercised in selecting cases with due regard to the peculiarities of the individual as well as of the disease, and remembering too, that improved nutrition lies at the bottom of all this mode of treatment.

The altitude of two thousand feet need not deter a patient with moderate valvular disease from visiting the Adirondacks,

but the stay should be prolonged, and the gradually graded exercise may possibly be extended to mountain climbing, the highest peaks being only five thousand feet above the sea.

We do not expect, at home, in our daily practice, to cure patients simply by the use of some vaunted remedy or without watching the daily manifestations or without attention to sanitary surroundings, or, indeed, without regard to individual peculiarities and physical dyscrasia. No more should we look to the mountains for beneficial results, unless we act with similar care and intelligence in deciding first what we desire to secure, and second, how best to secure it.

# DEFENCE OF PUBLIC HEALTH BOARDS.

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Probably no department of a city or town government has its efficiency and motives so much discussed as the department of health, and certainly no department needs the moral as well as the financial support as much. This is most likely due to the fact that few realize what the detail work is and the means at hand to deal with questions that effect the commercial as well as the sanitary interests of a city. It has long been the popular custom for many to belittle the work done by boards of health, some going so far as to assert that the support of a health board is a useless expense. Those most radically opposed to these boards are usually those who at some time have been offended at receiving notices to abate some nuisance upon their property. After nearly six years' experience the writer has yet to see the person who will acknowledge that his premises are in an unsanitary condition, but nearly all will readily admit that their next-door neighbors have maintained nuisances for years, and that the Board of Health has long been remiss in its duties not to have discovered this. Such persons have likely been indifferent to the board of health previous to receiving these orders, but immediately upon their receipt they become its deadly enemies for ever more and leave untried no opportunity to malign the members of the board and its employés and to obstruct the progress and efficiency of the department. Many of these are more or less politicians. While the health department is and rightly should be non-political, it is dependent upon the city fathers for its support.

These politicians and their aid are necessary to the existence of the department. These people with grievances against those who are only trying conscientiously to do their duty towards the whole community, looking only to the public welfare and without prejudice, make it their special business to oppose all propositions to forward the efficiency of the department and to prevent the appropriation of monies to carry on the work.

The medical profession to whom boards of health should look and do look for its strongest support, does not as a whole, coöperate and assist them with the unanimity one would naturally expect. It is a fact that those who do the least towards helping the work of boards of health being a success are the very ones who seem to doubt that any good is accomplished and are allowing their cases of contagious diseases to be so carelessly cared for as regards their contagion, as to be the most dangerous to the public. Every member of the medical profession should do his utmost to assist any suggestion made or law proposed that will render a community more sanitary. It should be borne in mind that boards of health are composed of gentlemen serving without pay, practically without patronage, many being actively engaged in the practice of medicine, without any personal interest for or against individuals, often even serving to the detriment of their private affairs. Why then should other practitioners feel as if their business were being interfered with by their co-laborers?

It is not the purpose of this paper to contend that these boards of health are infallible, but we do maintain that as a rule their motives are only for the wellfare of the public and the best interests of their constituents, and that they should not be the subjects of so much criticism as they often are. It is necessarily expensive to support a department of health in a way that it will be of the most benefit and have it satisfactory to all.

The State of Connecticut has no city that contributes to its board of health the financial and legal aid that enables it to do as thorough work as is desirable. Any place that has been raised to the dignity of a city, should give full control to its health board of all matters that pertain to the health of the community, or that can in any way become an unsanitary nuisance, and it should give to this body full legal power to abolish any place or business that has been proven to be unhealthy or offensive to the neighborhood in which it is located. Under the control of the board of health should be placed the collection and disposition of garbage, the drainage and ventilation of houses, public buildings and factories, the cleaning of streets, fat-rendering and slaughtering establishments, the removal of night-soil, etc.; last but not the least, these boards should have

the entire supervision and direction of contagious diseases. Most of these matters mentioned are now nominally under the control of the health department, but not in reality.

To the mind of the writer a board of health, to accomplish that which is expected and that for which it is intended, must have most liberal appropriations of money and the support of the other departments, especially the police department and the courts. When a community has received its charter as a city the time has passed for the garbage to be collected by any and all who wish, to be disposed of in the manner that suits the collector. The feeding of garbage to pigs is behind the times and has been legislated against by some states. The city itself, under the direction of the board of health, should collect all garbage and offal and it should be destroyed by them. Undoubtedly the best way to dispose of this is by cremation or by one of the so-called reduction processes, of which there are several having plants in various sections of the country. Cremation is considered by many as the most sanitary and it certainly has the advantage of being cheaper if the destruction is alone considered, but by the reduction process it is claimed by those interested, that the fat can be extracted in paying quantities and that the residue has a commercial value as a fertilizer. But before the destruction comes the collection, which, unless regularly and carefully done may in itself become a nuisance, as the city of New Haven has discovered to the disadvantage of quite a number of its citizens. The removal of garbage should be done as frequently as possible and in wagons especially constructed for this purpose.

No privy vault or cesspool should be allowed upon sewered streets. It is not possible for a vault to be maintained any length of time without it becoming offensive and dangerous. Without vaults and cesspools there must be necessarily more plumbing, which on account of the sharp competition among plumbers, may result in a more unsanitary and dangerous state of affairs than the privy vault, unless there are certain more or less elaborate specifications and a proper test by an experienced person. Hence the need of plumbing regulations and inspection. The street cleaning is done by the board of health in but few cities, yet it seems as if it properly came within the

jnrisdiction of the health department, but this is a matter of opinion.

Fat-rendering and slaughtering establishments should not be allowed in any city, as it is impossible to conduct either bnsiness in such a manner that they will not at times be a great nuisance to those living near them. The collection of offal from the market should be subject to the same restrictions as that of garbage. With the abolition of privy vaults the night-soil remover has lost his occupation, but as in reality some vaults will be in use for many years, he mnst remain.

These collectors should be licensed and the number of licenses should be kept as small as is consistent with the amount of work, only odorless excavators should be used, and the work should be done in the day time. Most cities require it to be done in the night. Perhaps taking into consideration only that the business is unsightly and disgusting, this is better, but when we consider that this work always creates more nauseating and offensive smells in the night season and that the laborer is more likely to be careless and slovenly when he can not be seen abont his work, it seems that during the day was the proper time, when any neglect could be seen and the responsible party punished.

Contagious diseases can never receive proper care until public sentiment has advanced much beyond its present condition. This advancement is being made, but very slowly. It has now reached that point where most persons think it is a serious thing if a contagious disease happens in the vicinity of their homes, but if it occurs in their own families it is far from being serious and any advice from others is nnnecessary and meddlesome. Until as prompt action is taken and as rigid a quarantine established in cases of scarlet fever and diphtheria, our most common contagious diseases, as in smallpox, these diseases will always be prevalent. Never can they be as effectually stamped out as smallpox has been, as we have no way of rendering ourselves immune from them as we have in vaccinating against smallpox. It is to be hoped antitoxin will do for diphtheria all that is claimed for it. There is a way that these diseases can be reduced to a minimnm and much sickness and distress averted. To reach this minimum the medical profession must lend its aid nnreservedly.

Contagious diseases must be reported without delay to the board of health and prompt and decisive action must be taken by the agents of the board. This means a great expenditure of money, as contagious diseases can not be handled effectively without great expense. A hospital for contagious diseases, of which more will be said later, is indispensible. It should be the duty of the representative of the board of health in all cases among both rich and poor, to see that the sick are properly isolated, with only the necessary attendants, and that all other members of the household and all others who have been exposed, are quarantined until the period of incubation has passed. The right kind of a quarantine can only be maintained by a police patrol, as a moral quarantine is of no value whatsoever. If, in the opinion of the person reprcsenting the health department, the sick can not be well isolated and cared for at home, he should have power to remove them to the hospital for these diseases and the house should at once be thoroughly disinfected. Here again we must have expensive apparatus, which must be operated by persons skilled in its use and who can be trusted to be thorough in every detail.

A complete hospital for contagious diseases is a requisite in every city and borough. A pest-house, as familiarly called, is not adequate nor is it consistent with a scientific care of these diseases. Such a hospital should be aseptic in all of its appointments and it should be provided with modern machinery for disinfection of clothing, bedding, etc. In addition to the rooms of the sick there should be a suitable operating-room. How many lives could be saved yearly and how much sorrow could we escape, if we had ready at all times a place in which contagious diseases could be properly cared for by skilled physicians and nurses at a moment's notice? Tracheotomy and intubation could then be done with some hope of success. There is no doubt but many lives could be saved that are now lost from diphtheritic laryngitis, if they could be operated upon early and have the necessary care after the operation. In addition to the hospital proper, there should be a place for the detention of suspects and a place in which people could be accommodated while their homes are being disinfected. There should be a corps of assistants, trained in their several departments. In small cities

it would not be necessary to have a large number constantly on duty. It could easily be arranged so that outside help could be called in if needed. A city of the size of New Haven ought to have constantly at least a housekeeper, a trained nurse, and a man to help about the place and to drive the ambulance, which should be for the exclusive use of the hospital. The board of health should have portable disinfecting apparatus, consisting of fumigating furnaces, a drench in which bichloride and carbolic solutions could be used, and if practicable, a portable steam-chest in which small articles could be disinfected without being removed from the premises. Many other things would undoubtedly be of great benefit to a perfect board of health, but these mentioned are considered by the writer essential to good work, and never without them can the result of the work of these boards be of the desired value. No city hesitates to maintain at great expense a police and a fire department. These are liberally provided with everything to make their work complete and of value to the public. If these departments are made perfect by liberal appropriations for the protection of our property, why then should not that department whose only object is to protect the health and lives of the whole community, receive as substantial support?

# REMARKS ON THE TREATMENT OF DIPHTHERIA BY ANTITOXIN. *

BY WILLIAM H. WELCH, M.D., PROFESSOR OF PATHOLOGY IN THE JOHNS HOPKINS UNIVERSITY, BALTIMORE.

In the preparation of the paper to open the discussion on antitoxin at the recent meeting of the Association of American Physicians, I have had occasion to look up the evidence which has thus far been published concerning the efficacy of the serum treatment of diphtheria. When honored by the invitation of your President to present a paper at this meeting, it seemed to me that it might be acceptable to offer some of the results of this study of a subject which is now the foremost medical question of the day. What I shall have to say will be taken largely from my paper prepared for the meeting of the Association in Washington, and I must refer those who are interested in a fuller and more detailed consideration of the subject, particularly on the statistical side, to the paper published in the Transactions of the Association of American Physicians for 1895.

The general principles of serum therapy of diphtheria were fully set forth in an article published by Behring and Wernicke in 1892, in which the results of their experiments, briefly communicated in August, 1891, to the Seventh International Congress of Hygiene and Demography, in London, were presented in detail. After several tentative experiments in the treatment of human diphtheria by antitoxin, Ehrlich, Kossel and Wassermann in April, 1894, reported the results of serum treatment of two hundred and twenty cases of diphtheria in six Berlin hospitals. This publication marks the beginning of the era of serum treatment of human diphtheria by approximately sufficient doses.

It was not, however, until the memorable address of Roux at the Eighth International Congress of Hygiene and Demography in Budapest, in September, 1894, that the attention of

* Before the Litchfield County Medical Association in Norfolk, Conn.

the great body of physicians throughout the world was directed to the new treatment, Most of the literature upon this subject has appeared since this last date.

It can not be successfully questioned by anyone who recognizes the Loeffler baccilus as the cause of diphtheria that the treatment of this disease by antitoxin rests upon a sound experimental basis. The treatment of tuberculosis by tuberculin never was based upon satisfactory experiments upon animals and it is hardly necessary to say that this method of treatment has nothing in common with serum therapy.

The laboratory does not furnish any more impressive experiments than those which demonstrated the power of antitoxic serum to prevent and to cure the disease caused in animals by inoculation with the diphtheria bacillus or its poisons. The serum arrests the spread of the local process and abates the symptoms of general toxenia.

There is identity in essential points between experimental diphtheria and uncomplicated human diphtheria. In both the local inflammation at the site of infection is caused by the multiplication of the Loeffler bacillus and the lesions of internal parts, and the systemic symptoms are due to the absorption of toxic substances formed by this bacillus. It would be difficult to understand why an agent with the specific power of neutralizing the effects of these toxic substances in animals should be unable to neutralize in human beings similar effects of the same toxic substances, provided this agent can be given in the proper dose and at the right time.

Dosage and timely administration are factors of the first importance in determining the efficacy of antitoxic treatment. It is our inability to conform to the demands of these factors which has rendered thus far the treatment of tetanus in human beings by its antitoxin distinctly disappointing. We can not recognize the existence of tetanus until the first muscular spasms appear, and by that time such an amount of poison has accumulated in the body that it is usually too late to effect cure by the administration of tetanus antitoxin. Diphtheria, on the other hand, we can recognize before so large an amount of poison has been produced and absorbed as is beyond the capacity of the healing serum to counteract.

The evidence derived, both from experiments on animals and from observations on human diphtheria, is decidedly in favor of the view that antitoxin does not directly neutralize the toxin in a chemical sense, but rather that each of these substances acts in an antagonistic manner upon the living cells of the body. It follows that in order to secure the beneficial effects of antitoxic treatment the cells must be able to respond in the proper way to the introduction of the antitoxic serum. This responsive power may be partly or completely annulled by intense or prolonged action of the diphtheria poisons or by other previous or coexistent disease.

One of the most important characters of antitoxin is that it requires a definite quantity of this substance to neutralize the effects of a definite quantity of toxin. We have no precise method of determining how much and how virulent the poison may be in a given case of diphtheria nor how susceptible to the poison the patient may be. The dosage of antitoxin, therefore, in human diphtheria is empirical, the main circumstances determining it being the age of the patient, the assumed duration of the disease up to the time of beginning the treatment and the apparent severity of the disease. It may readily happen that an insufficient dose is given. We now know that in the early period following introduction of the treatment entirely insufficient doses were given.

It has been abundantly demonstrated that the earlier the healing serum is injected after the beginning of the disease the better are the chances of recovery, a fact which will be apparent when we consider the results of the treatment according to the day of its inception.

The Loeffler bacillus is capable of causing all grades of inflammation of the throat, from a mild erythematous angina to the gravest pseudo-membranous inflammations. Clinicians are not all willing to adjust their diagnoses according to the etiological requirements of the bacteriologist, but in my judgment there must be a readjustment of previously adopted boundary lines of diagnosis in accordance with these requirements, inconvenient as this may be.

While the domain of diphtheria has thus been widened by the inclusion of cases not presenting the ordinary anatomical and

clinical characters of diphtheria, in another direction it has been restricted by the exclusion of some cases which on clinical grounds would be diagnosed as diphtheria, but which by bacteriological examination are proven to be caused by other microorganisms than the Loeffler bacillus.

In my opinion the number of cases of primary clinical diphtheria which the physician would confidently diagnose as genuine diphtheria, but which on bacteriological examination are found not to be referable to the Loeffler bacillus is small, not over five to ten per cent. of the cases. But a considerable proportion, twenty-five to thirty per cent., of the cases which the physician himself considers doubtful or only more or less suspicious of diphtheria, are not genuine diphtheria in the bacteriological sense. The name "diphtheroid" is, perhaps, preferable to the name "pseudo-diphtheria" to designate these pseudo-membranous inflammations not due to the diphtheria bacillus.

I speak of those points which have resulted from the bacteriological study of human diphtheria as they have a manifest bearing upon the application of serum therapy to diphtheria, as will appear presently when we consider the statistical data as to the efficiency of this treatment.

It is important to bear in mind that many cases of human diphtheria differ from experimental diphtheria in the existence of complications and secondary and mixed infections due to other bacteria than the Loeffler bacillus. The streptococcus pyogenes is the most common and dangerous of these secondary invaders. Antitoxin is powerless against these other bacteria. It counteracts the effects of only the Loeffler bacillus.

It is by no means always easy to determine during life by the lesions and symptoms whether or not mixed and secondary infections exist. Reiche found in forty-two autopsies on cases of genuine diphtheria streptococci and staphylococci in the kidney or spleen in no less than sixty-four and three tenths per cent. of the cases. Streptococci were found in the kidney in one case as early as the second day of the disease. The mere examination by the microscope and by cultures of the exudate in the throat is not decisive as to the existence of mixed infection. The mere presence of pyogenic cocci in this situation is not proof that

they are pathogenically active, for they are very common inhabitants of the healthy and the inflamed throats.

Without doubt the remedial rôle of antitoxin is materially restricted by its inability to combat streptococcus sepsis, bronchopneumonia, and other complications referable to secondary infection, or to stop impending suffocation by the immediate removal of false membrane in the deeper air passages, but the antitoxic serum is the most powerful agent which we possess to prevent the development of these complications and secondary infections. Timely administration of healing serum by antagonizing the effects of the Loeffler bacillus counteracts in large measure the causes of the increased susceptibility to infection by the widely distributed secondary invaders and thus greatly lessens the frequency of their occurrence.

Antitoxin can not restore cell life already irretrievably damaged by the diphtheria bacillus or its poison. We have no way of gauging accurately at any given period of the disease the amount of damage already inflicted upon the cells. It is certain that the cells may be severely injured before we are able to recognize such injury by manifest symptoms. P. Meyer detected pathological changes in the peripheral nerves as early as the third day of the disease and before paralysis was apparent. The occurrence of paralysis, including cardiac paralysis, and of nephritis after administration of antitoxin as late as the third day or even the second day of the disease can not necessarily be attributed to failure of this agent to neutralize toxin developed after its injection.

Such are the more important general considerations to be borne in mind in estimating the scope and efficiency of the serum treatment. Let us now turn to the evidence which has hitherto been published concerning the value of the new treatment. This evidence is of two kinds, first the general impressions of physicians who have tried the treatment in a number of cases, and secondly the mortality statistics of cases treated by antitoxin.

I attach great value to the conclusions of careful clinical observers as to the merits of therapeutic agents, a value which can not be expressed in mere statistical figures.

It is highly significant that the testimony in favor of antitoxin

is the strongest and most positive among those who have had the largest experience in its use, whereas the doubtful and uncertain opinions come mainly from those with limited experience in the employment of antitoxin. There are very few decidedly hostile judgments and these in no instance from physicians who have used antitoxin in a large number of cases.

It is not difficult to understand why a large experience is required to convince a cautious observer of the specific curative properties of antitoxin. Although the healing serum is a new and strange remedy, its effects in individual cases are not new and strange. Nothing happens which the physician may not occasionally have seen to happen by other methods of treatment. Even if the local process is promptly arrested and the constitutional disturbance is quickly abated, he is likely to feel that the same thing might have happened without the injection of antitoxin. What is new and strange is the frequency with which in case after case the timely injection of antitoxin arrests the disease. It is because the recovery following the injection of antitoxin is such a natural kind of recovery, for it is cure by nature's own remedial agent, that it requires the observation of many cases to convince the conservative physician that the new treatment really exerts a specific effect.

Although many of those who have treated only a few cases by antitoxin are very enthusiastic in its favor, their limited experience justifies only a wise conservatism in the expression of their conclusions. Still less justifiable than the enthusiasm of those just referred to, is the expression of hostile judgment on the basis of a small number of cases in which the benefits of the treatment are not apparent, in view of the overwhelming testimony in its favor from those who have treated hundreds of cases. When one considers the importance of timely administration of antitoxin and the obstacles which have already been mentioned to uniformly successful results from its use, it is surprising that there should have been so few reports in which there has not been an apparent reduction in fatality by the serum treatment.

Bagiusky has reported thus far the greatest number of cases by antitoxin by a single observer. In explaining why, at the end of ten months' trial, he has determined to commit himself to

a definite judgment in its favor, he says: "The reasons for this are the continual repetition of improvement and recovery of severe cases which previous experience indicates would have terminated fatally and, furthermore, the outcome of an involuntary experiment with interruption of the use of the serum for a period on account of failure in its supply. During this period the mortality of our patients immediately rose again to its former height."

In not less favorable terms than those of Baginsky are expressed the opinions of such observers of high reputation and large experience as Heubner, Ganghofner, von Widerhofer, von Ranke, Escherich, Bokai, and the physicians of the Hôpital des Enfants-Malades and Hôpital Trousseau in Paris. These physicians have reported already in detail over two thousand three hundred cases of diphtheria treated with antitoxin.

But general clinical impressions, convincing as they may be to the individual receiving them, do not furnish a strictly scientific proof of the value of a therapeutic agent. It is often all only by statistics, much as they may be decried by some and difficult as it may be to guard them from errors of interpretation, that a strictly scientific demonstration of the efficacy of antitoxin in the treatment of diphtheria can be brought.

Each report of a series of cases treated with antitoxin requires its own special consideration and analysis and is not comparable with reports from other sources relating to a different class of cases. This is clear when one considers that the fatality from diphtheria varies within wide limits according to such circumstances as the more or less severe character of the prevailing epidemic, the season of the year, the age of the patients, the method of treatment, the ratio of laryngeal and of septic cases, the residence in cities or in country districts, the facilities and skill for intubation and tracheotomy, whether treated in private practice or in hospitals, the accuracy of the diagnosis and especially its control by bacteriological examination, the sanitary surroundings, etc.

The larger the number of cases embraced in the statistical tables the greater becomes the mutual compensation of such differences as those mentioned and, therefore, the more trustworthy are the conclusions derived from the statistics. I attach, how-

ever, less weight to the mere gross percentage of deaths among all cases treated than to the results of a careful analysis of the cases according to such points of view as will be presently considered.

It is scarcely ten months since antitoxin has been nsed by more than a very few favored physicians and it is a much shorter time since its use has become at all general. In this comparatively short time there have, however, been pnblished more or less definite reports of the resnlts of the treatment in over fifteen thousand cases. I have collected eighty-six reports from eighty-four different sources containing seven thousand three hundred and eighty-one cases. I have not included any reports of single cases, as these are often to illustrate some special point, nor any reports of series of cases less than ten. This collection of cases is by no means complete, but it is believed to include all of the more important reports thus far published with details concerning the cases treated. I have included all of the reports of the character indicated which have come to my notice, although the reports differ greatly in valne, some being meagre and unsatisfactory, others full and carefully analyzed.

I have prepared a number of tables, which accompany my paper in the Transactions of the Association of American Physicians, already referred to. In the first table are contained the total number of cases treated by antitoxin in each series reported, the number and percentage of deaths, the previons fatality from diphtheria in the same hospital or locality from which the series is derived, and references to the reports with statements as to whether the cases are from hospital or from private practice. In the second table the results of antitoxin treatment are given for the cases not operated on, for those eperated on by intnbation or tracheotomy, and the previous fatality in the same hospitals or localities from intnbation or tracheotomy. In the third table the cases are analyzed according to the ages of the patients, and in the fourth table according to the supposed day of the disease on which antitoxin was injected.

I must refer those who may be interested to the more extended article for the study of these tables, and I shall present on this occasion only a snmmary of the more important resnlts of this statistical investigation, the main purpose of which was to

learn the value of the evidence thus far accumulated as to the curative power of antitoxic serum.

The fatality of the seven thousand three hundred and eighty-one cases of diphtheria treated with antitoxin which I have collected was seventeen and two-tenths per cent. *

Among these cases are included many treated during the early period after the introduction of the serum treatment with wholly insufficient doses. There are also included a large number of cases dying from a complicating disease not referable to diphtheria or dying within twenty-four hours after beginning the treatment, cases which can not properly be regarded as indicating failure of the serum treatment. Many of the reports give percentages corrected by elimination of these latter cases, but I have not used these reduced percentages, as in order to justify comparison with former fatality statistics, it is necessary to include all of the deaths. It is to be understood, however, that these corrected percentages give a much more favorable showing for antitoxin than the percentages based upon all of the deaths. The larger statistics come from childrens' hospitals. The collection of cases contains at least five to six times as many cases from hospital practice as from private practice, the fatality from diphtheria being, as is well known, much higher in general in the former than in the latter.

Under these circumstances it must be admitted that the percentage of deaths among these seven thousand three hundred and eighty-one cases treated with antitoxin is so low as to speak strongly in favor of the efficacy of the serum treatment. There is, however, no standard of comparison for the fatality in this entire group of cases. It can not be properly compared with

* In the present paper I have added to the list of cases of the previous paper the following, which have been reported since its preparation: Fürth, (abst. The Medical News, August 17, 1895), one hundred cases in hospital, fatality twelve per cent., previous fatality thirty-nine per cent., tracheotomy in thirty-one with eleven deaths, previous fatality from tracheotomy seventy and four-tenths per cent.; Egidi, twenty cases, fatality twenty-five per cent.; Ricci, ten cases, fatality ten per cent.; Morax, eighty-five cases (hospital and private practice), fatality sixteen and four-tenths per cent., previous fatality thirty-seven to sixty-four per cent. (Abstracts of last three reports in British Medical Journal, August 10, 1895).

fatality statistics from hospitals, nor with those from private practice, nor with the general fatality of all cases treated in cities, such as are to be found in the reports of boards of health.

In forty-eight reports the previous or simultaneous percentage of deaths from diphtheria not treated with antitoxin is given for the same hospital or locality in which were the cases treated with antitoxin. These reports contain five thousand five hundred and ninety-one cases of diphtheria treated with antitoxin, with one thousand and thirty-four deaths, or eighteen and five-tenths per cent. If we calculate the number of deaths in each series of cases upon the basis of the previous fatality, selecting the lowest figures given, we have two thousand three hundred and forty-nine deaths, or forty-two per cent. There was, therefore, on this estimate by the use of antitoxin an apparent reduction in the number of deaths of fifty-six per cent.

There must be a much greater difference between the characters of the cases treated with antitoxin and of those treated by ordinary methods than appears from the statements of the writers and the details of those cases described, if this striking reduction in the number of deaths is not due in large part to the serum treatment.

If we separate the hospital cases from those in private practice we have from sixty-two reports five thousand eight hundred and seventy-seven cases of diphtheria treated with antitoxin in hospitals. These furnished one thousand and ninety-two deaths, giving a percentage of eighteen and six-tenths. Although this is not an unheard of fatality from diphtheria treated in hospitals, it is most exceptional and strongly suggests the possession of specific curative properties by antitoxin.

There are forty-two reports in my collection of statistics which give for the same hospital the previous percentage of deaths from diphtheria not treated with antitoxin. These reports furnish four thousand nine hundred and ninety-nine cases treated with antitoxin, with nine hundred and fifty-six deaths, or nineteen and one-tenth per cent. If we calculate the number of deaths which would have occurred among these cases had the previous percentages of fatality obtained, selecting the lowest percentages given, there would have been two thousand one hundred and sixty-nine deaths, or forty-three and four tenths per cent. The

apparent diminution in the number of deaths in hospitals by the use of serum is according to this estimate fifty-six per cent. If only the larger and most carefully analyzed and satisfactory statistics from the principal hospitals, mainly childrens' hospitals, had been selected there would have been in over three thousand cases an apparent reduction in fatality by the use of serum of sixty per cent.

The natural interpretation of these statistics showing an apparent reduction in fatality of fifty to sixty per cent. by the serum treatment is that the healing serum exerts a specific curative power over diphtheria.

What are the objections which may be and have been urged against this natural interpretation of the statistical figures? The critics and opponents of the serum treatment have directed their attacks mainly against this statistical evidence. To some of their objections undoubtedly considerable weight is to be attached. As we shall see later an analysis of the cases from other points of view meets the more serious objections of the critics and furnishes additional and in my judgment new conclusive evidence in favor of the antitoxic treatment, but let us first consider the main arguments urged against the value of such statistics as we have now before us.

The principal arguments in opposition to the interpretation of these statistics as demonstrative of the curative properties of antitoxin are, first, that the prevailing type of diphtheria since the employment of antitoxin is a mild one; second, that more cases of diphtheria are now treated in hospitals than before the serum treatment and especially more cases in early stages of the disease, whereas there is no corresponding increase in the total number of cases of diphtheria and there is no reduction in the total number of deaths from diphtheria in the entire community; third, that the adoption of the bacteriological, as opposed to the purely clinical, diagnosis of diphtheria operates in favor of a lower percentage of deaths and that therefore the antitoxin statistics are not properly comparable with former statistics of fatality; fourth, that sanitary inspectors and health officers now ferret out many mild cases of diphtheria, especially among school-children, which would otherwise have remained undetected or passed for simple sore throats; fifth, that the use of anti-

toxin has led to the abandonment of former methods of treatment, particularly of irritating local applications, which are injurious; sixth, that the results of serum treatment are no better than those obtained by other methods of treatment. We will consider these objections seriatim.

I. In some places the prevailing type of diphtheria seems to have been mild, but the great majority of the observers whose reports are included in my statistics, consider that the prevailing diphtheria in their localities has been of average severity and they cite in many instances the simultaneous fatality of cases not treated with antitoxin as proof that the disease is not of particularly mild type, indeed, in several places it seems to have been of more than average severity.

It is, moreover, the statement of von Ranke, Bokai, and of several other physicians in charge of the diphtheria wards of hospitals that so far as their hospitals are concerned, as a rule severe and advanced cases are sent there by physicians in the city, often for operative relief, and that when the epidemic is mild in character they receive fewer cases, but not many milder ones. Doubtless these conditions will not hold for all hospitals, particularly not for such as are intended for the compulsory isolation of cases of diphtheria, but they are probably applicable to many of the hospitals from which the reports now under consideration are derived.

II. I attach decidedly more weight to the second criticism. A larger number of cases now than formerly in early stages of the disease have been admitted to many of the hospitals where the serum treatment has been employed. The advocates of the treatment have properly insisted upon the importance of early injection of the serum and the claims of the new treatment have been widely published in the daily press, so that, especially during the time when the serum was not to any extent in the hands of general practitioners, it would be natural to suppose that physicians would send their patients and parents take their children to such hospitals as soon as possible after recognition of the disease. Inasmuch as with any approved method of treatment the results are better the earlier it is begun, it is evident that statistics based on the former experience with the treatment of diphtheria in hospitals would not be altogether

comparable with the antitoxin statistics from the same hospitals.

At the same time it is to be considered that there has been a large amount of skepticism among physicians and the general public as to the value of the new treatment. The disappointments of the tuberculin treatment have had not a little to do in engendering such skepticism. Rapmund, in his efforts to establish in the district of Minden a collective investigation of serum therapy in diphtheria, found the physicians so skeptical that of one hundred and ninety-four practitioners, only twenty would use it at all and only two employed it extensively. There are also statements as to the refusal of parents to have it tried on their children. There does not appear to have been such a general rush of patients to hospitals for early treatment as some of the critics would have us believe.

Still the reports from Berlin and several other cities show a notable increase in the number of patients with diphtheria treated in hospitals during the serum period and this without a corresponding increase in the general morbidity from diphtheria. It is true that many of the reports state that during the period of serum treatment patients were not received in any earlier stages of the disease than formerly. Heubner, in his recent address at the Congress of Internal Medicine, in Munich, admits that lighter cases of diphtheria go to the hospitals now than formerly, but that this is not enough to explain the great reduction in fatality. There are, undoubtedly, considerable differences in different hospitals as to the proportion of cases admitted in early stages of diphtheria, but in several of the hospitals where the benefits of antitoxic treatment have been most apparent it is expressly stated that the number of mild cases admitted is no greater than formerly.

If we make all due allowance for this increase in the proportion of early cases treated in hospitals, and certainly we must make considerable allowance, this factor seems to me altogether inadequate to explain the apparently great reduction in the fatality of diphtheria treated with antitoxin. This conclusion will be enforced when we come to compare the results of early treatment by serum with those of early treatment by other methods.

III. It is a favorite criticism of antitoxin statistics that the bacteriological control of the diagnosis operates in favor of a relatively low percentage of deaths. It has been contended by some that the antitoxin statistics include a large number of cases of mild diphtheric sore throats, without pseudo-membrane, and recognizable as diphtheria only by the detection of the Loeffler bacillus. In most of the statistical reports from hospitals on antitoxin treatment the statement is expressly made, and it is apparent from the description of the cases, that they do not represent anything else than the usual run of cases of diphtheria as they have regularly for years past presented themselves in the same hospitals. The mild diphtheric sore throats, without clinical evidences of ordinary diphtheric, are not likely in any large number to be recognized at all as diphtheria and still less likely to find their way into general hospitals, from which most of the statistics are derived. Where, as in the statistics of Baginsky and others, sufficient detail concerning each case is reported to enable the reader to form an intelligent estimate of the character and severity of the case, it is evident that affections without the customary anatomical and clinical characters of diphtheria do not enter into the statistics.

It is erroneous to say that antitoxin statistics are not based upon the clinical diagnosis of diphtheria. The diagnosis is clinical, but with subsequent bacteriological control. The cases are admitted to the hospital with the clinical diagnosis of diphtheria and the serum is or should be at once administered without waiting for the results of the cultures.

The recognition of mild and very mild cases of diphtheria is not a discovery of the bacteriologist, but has long been known to physicians, nor is it a peculiarity of antitoxin statistics that mild cases are included. They appear equally in previous fatality statistics of diphtheria.

As regards the exclusion from antitoxin statistics of cases presenting clinical characters of diphtheria, but without the Loeffler bacillus, this with thorough bacteriological tests, will affect only a small number of cases presenting the appearances of unmistakable primary diphtheria, but will affect a considerable number of cases regarded as only suspicious or doubtful on clinical grounds. Although some of the diphtheroid, pseudo-

membranous cases are very grave affections, their general fatality is much lower than that of genuine diphtheria.

Their exclusion, therefore, from antitoxin statistics results usually in a higher, not a lower percentage of deaths, as is clearly shown in the statistics of Roux, Sevestre and Meslay, Kurth and others. The serum has of course no curative influence or pseudo-membranous inflammations not caused by the Loeffler bacillus.

In a considerable number of the reports the diagnosis of diphtheria is purely clinical and without bacteriological control. In these the benefits of the serum treatment are clearly apparent. Of course in ordiuary general practice it is not to be expected that the diagnosis will rest upon a bacteriological examination but in the absence of such examination it should be understood that there must be occasional instances of apparent failure of antitoxin which would be found explicable had a bacteriological examination been made. Only those observations which are based upon the thorough bacteriological examination of the cases of diphtheria treated by antitoxin can lay claim to entire accuracy.

IV. Where, as in New York and Boston, there is systematic sanitary iuspection and intelligent efforts are made to discover, properly diaguose and isolate cases of diphtheria, undoubtedly many mild cases which would otherwise have escaped detection are recognized and treated. It is, however, absurd to claim that mild dipththeric sore throats thus ferreted out by sanitary inspectors compose any considerable proportion of the cases which make up the antitoxin statistics. The great majority of the European hospitals from which the bulk of our statistics come, are not intended for the compulsory isolation of cases sent there by health-officers. The patients are sent to these hospitals by physicians or are admitted with the clinical diagnosis of diphtheria, and these hospital cases are in general more advanced and severe than the average of those treated in private practice. It is only necessary to read the reports from these hospitals to be convinced that cases without the ordinary anatomical and clinical characters of diphtheria do not figure in their statistics to any appreciable extent.

V. The advocates of the serum treatment in general advise

that such local and general measures of treatment as have hitherto been found useful in the treatment of diphtheria should be continued. Antitoxin does not supplant these other approved methods of treatment, it is to be combined with them. Caustic and irritating local applications are not advised. The opinion which has been advanced that the apparent benefits of the serum treatment are referable to the abandonment of formerly employed injurious therapeutical measures seems to me scarcely worth serious consideration.

VI. It is manifestly unfair to compare the results of the serum treatment of thousands of cases of diphtheria in various hospitals, many with previous high rates of fatality, with the lowest percentages of deaths which can be found as the exceptional experience at certain periods of a few hospitals of a few physicians. Surely some consideration should be given to the previous results by the ordinary methods of treatment in the same hospitals from which the serum treated cases come. Kohts may be mentioned as one who on the basis of forty-seven cases treated with serum with 29.1 per cent. deaths among the tracheotomized and 7.6 per cent. among the non-tracheotomized finds such apparently favorable results no better than by other methods of treatment. We are told that diphtheria is a far less fatal disease than we had been led to suppose. Such experiences as those of Kohts (and Sigert) and of Mosler, who are able to produce results from other methods of treatment approximately as favorable as those obtained by the use of antitoxin, must be regarded as exceptional, and are not in accord with the observations of the vast majority of those who have used antitoxin in any considerable number of cases.

We have now considered the principal objections which have been made to the natural interpretation of statistics showing an apparently great reduction in the fatality from diphtheria by the use of antitoxin. I believe that it has been shown that even if all possible allowance be made for such assumptions as those considered, they are still wholly inadequate to account for an apparent reduction in the deaths from diphtheria by serum treatment of fifty to sixty per cent. in five thousand cases collected from hospitals in Germany, France, Austria, Italy, England and America and reported by forty different physicians, most of

whom are of high reputation and large experience. These statistics seem to me to establish beyond all reasonable doubt the conclusion that antitoxin is a specific curative agent for diphtheria.

We possess as yet very little information as to the influence of the serum treatment upon the total number of deaths from diphtheria in cities. It is to be expected that when sufficient time has elapsed and the employment of antitoxin in the treatment of diphtheria has become sufficiently general, the reduction in mortality by its use will be apparent in municipal mortality returns. This would already appear to be the case in some cities, but the data on this point which I have been able to obtain do not seem to me sufficiently abundant or satisfactory to make it worth while to consider them here.

The reports of Risel, from Halle, and of Kurth, from Bremen, are based upon the results of serum treatment both in private practice and in hospitals in these cities, and include all of the cases treated by nearly a hundred physicians among all classes of society. These interesting reports speak strongly in favor of the possibility of bringing about a great reduction in the general mortality from diphtheria in cities by the use of antitoxin.

It is in private practice, especially among those classes who are in the habit of calling the physician early in the disease, that the best results from serum treatment are to be expected, for here there is more frequent opportunity for timely treatment. I have collected eighteen reports of series of cases treated by antitoxin in private practice. These include six hundred and sixty-three cases with forty-six deaths, giving a fatality percentage of only six and nine tenths. This would indicate that the serum treatment may reduce the fatality from diphtheria in private practice to one third that under the same treatment in hospitals. Some of the reports of the results of serum treatment in private practice furnish most remarkable evidence of the efficacy of this treatment.

A partial report has been published of the results of the collective investigation of the treatment of diphtheria with and without serum, instituted by the Deutsche Medicinische Wochenschrift. This report is based upon the returns of cards sent

to physicians and includes ten thousand three hundred and twelve cases of diphtheria, of which five thousand eight hundred and thirty-three cases were treated with serum, with a fatality of nine and six-tenths per cent., and four thousand four hundred and seventy-nine were treated without serum with a fatality of fourteen and seven-tenths per cent. There was, therefore, an apparent reduction in fatality by the use of antitoxin of thirty-four and seven tenths per cent. Presumably these cases were treated in private practice, although it is not so stated in the provisional report. A fuller report on these cases is promised. The apparent reduction in fatality by the use of serum in these cases is much smaller than appears from my tables, but this may be partially accounted for by the fact that of the cases treated with serum, seven hundred and thirty-five were under two years of age, and of those not treated only four hundred and ninety-eight were under two years; between two and ten years of age there were four thousand and thirty serum-treated cases, and only two thousand seven hundred and ten cases of the group not treated with serum; over ten years of age there were one thousand and sixty-eight cases treated with serum and one thousand two hundred and seventy-one cases without serum. The two groups, therefore, differ materially in the distribution of cases according to the ages of the patients and the resulting low percentage of deaths in favor of serum is, in consequence of this, significant.

A most convincing demonstration of the healing power of antitoxin is supplied by the experience of Baginsky during an involuntary pause in the serum treatment caused by failure in the supply of serum. Between March 15, 1894, and March 15, 1895, there were treated in Baginsky's service in Berlin, by antitoxin, five hundred and twenty-five children, with a fatality of fifteen and six tenths per cent. During the period of enforced interruption of the serum treatment, this period being chiefly the months of August and September, one hundred and twenty-six children were treated without antitoxin, with a fatality of forty-eight and four tenths per cent. There was absolutely no selection of cases in either group. In his comments upon this experience Baginsky says: "It is all the more remarkable as the ratio of mortality of those treated with the serum, both be-

fore and after the period of interruption, varied within very small percentage figures. If one will permit figures to speak at all, there has scarcely been made on human beings a more demonstrative test of the curative power of a therapeutic agent. It was an experiment forced upon us, but it proved to us how terrible was the form of disease which we were treating and how nnmerous would have been the victims without the use of healing serum."

A similar experience has been reported by several other writers. Thus Körte noted a rise in fatality from thirty-three and one-tenth per cent. during the serum period to fifty-three and eight-tenths per cent. during the period of failure in the supply of serum; Ganghofner, under similar conditions, a rise from twelve and seven-tenths per cent. to fifty-three and two-tenths per cent; Heim, from twenty-two per cent. to sixty-five and six-tenths per cent., and during the epidemic in Trieste the fatality rose from eighteen and seven-tenths per cent. to fifty per cent. when the serum failed. All of these highly significant observations were made on cases occurring in the same epidemic, the period of enforced interruption of the serum treatment being preceded and followed by the serum treatment.

Most noteworthy has been the improvement in the results of serum therapy of diphtheria in Paris hospitals since Roux's original communication to the congress in Budapest in September, 1894. The fatality has descended from Roux's original percentage of twenty-six, in the later reports to fourteen, twelve and ten per cent. and it at present oscillates between eight and fourteen according to a recent statement of Moizard, who says: "This result can no longer be attributed to fortunate series of cases, as was claimed at the beginning by adversaries of the method. Thousands of patients have been treated and it can now be said that the controversy is closed." In general, the later reports of the results of serum therapy are more favorable than the early ones.

A most important classification of diphtheria for estimating the curative value of antitoxic serum is that into cases with and without laryngeal stenosis (croup), and especially when such degrees of stenosis are considered as require operative interference by intubation or tracheotomy. No one can claim that

laryngeal diphtheria requiring operative relief is anything but a severe disease. If the benefits of antitoxin are unmistakably manifested in operated cases of croup, then the test is an *experimentum crucis* and puts an end to the objections of those who assert that the apparently favorable results of serum therapy in diphtheria are attributable mainly to the large proportion of mild cases treated.

In my paper in the Transactions of the Association of American Physicians will be found a table which gives the results of serum treatment in operated and not operated cases of diphtheria, together with the previous or simultaneous percentages of fatality from operation in cases of diphtheria treated without serum. In presenting the following summary of the results, I have added to the previous list the cases from the reports of Furth, Egidi and Ricci, already referred to.

Of the four thousand four hundred and twenty-four cases in this collection treated with serum, twenty-seven and four-tenths per cent. required tracheotomy or intubation. Of the five thousand eight hundred and thirty-three cases treated with serum in the report of the collective investigation instituted by the Deutsche Medicinische Wochenschrift, tracheotomy was performed in only five and four-tenths per cent. of the cases. Evidently this latter material was of a character not well comparable with the mass of cases hitherto reported, chiefly from hospitals, but is probably representative of the experience in private practice.

There were many more cases of laryngeal diphtheria in my collection of statistics than the ratio of operative cases would indicate, for it is the testimony of the great majority of the observers that the stenotic symptoms of laryngo-tracheal diphtheria are relieved without the necessity of operation in a much larger proportion of the cases treated with antitoxin than by any other method of treatment. As is well known, recovery without intubation or tracheotomy from descending laryngo-tracheal diphtheria, especially in children, is exceptional under all other methods of treatment and the greater relative frequency with which such recovery occurs under serum treatment is a strong proof of the efficacy of antitoxin.

Von Ranke says that before the use of serum at most five per

cent. of his cases of diphtheric laryngeal stenosis escaped operation, whereas now thirty-three per cent. escape. Of Ganghofner's stenotic cases formerly twelve per cent. escaped operation, whereas now twenty-one per cent. escape. The experience of Heubner, Kossel, d'Espine and many others is similar.

In this respect the experience in the Paris hospitals has been most favorable. Roux says: "Of one hundred and sixty-nine children admitted to the service for diphtheric angina, fifty-six presented laryngeal symptoms. Under the influence of the serum (and in these cases one should not fear to make an injection every twelve hours), the dyspnea diminished, then occurred only paroxysmally, the child coughed up false membranes and at the end of two or three days the respiration became normal to the great astonishment of the internes and personnel of the pavilion who, with their large experience of children affected with croup, indeed thought that operation could not be avoided. To-day in the presence of a child with dyspnea it is not necessary to press for operation. One can inject the serum and wait as long as possible. Since the introduction of the serum the number of tracheotomies in the pavilion has diminished."

Baginsky may also be quoted to the same effect: "Here again the observation of the individual cases of laryngeal stenosis, and more especially of those which do not come to the point of operation, speak to me more forcibly than the statistical figures. The surprising regression of the laryngo-stenotic respiratory phenomena, the freedom of breathing, the disappearance of the hoarse voice and the croupy cough, the euphoria of the children, the change in their general condition so that two days after the injection they are sitting up in bed, playing and contented and observant of their surroundings, all of these things produce in him who has had before his eyes for years the hopeless picture of continually progressing laryngeal stenosis, in very truth ineffaceable impressions."

Not all writers report equally favorable results, but those with the largest experience are agreed that antitoxin relieves a considerable number of cases of laryngeal diphtheria without the necessity of operation. It is important to bear in mind that the rapid separation of the false membranes in the lower air passages may in itself be a source of danger and cause an increase

in the stenotic symptoms, unless these membranes are expelled or intubation or tracheotomy performed.

There is another point of capital importance as an indication of the value of serum treatment. Cases which are free from symptoms of laryngeal involvement at the time of injection of the serum do not develop such symptoms later, or do so only very exceptionally, unless evidence of such involvement appears within twenty-four hours after the injection.

Regarding neither this nor any other point is there entire unanimity of opinion in the varions reports, nor is snch to be expected from observers of limited numbers of cases with uneqnal distribution in the various groups of mild cases, of early cases, of anginas, of croup, of pure diphtheria, of septic diphtheria, of diphtheroid and of gennine diphtheria. It is only surpising that there are not more conflicting statements. But there are not many points concerning which there are so few differences of statement as concerning the efficacy of antitoxin in preventing descent of the diphtheritic process to the larynx and the trachea.

It follows from what has been said that in view of the power of antitoxin to abate beginning and moderate symptoms of stenosis, operation will be delayed rather than hastened and, when performed, the indications for it will generally be urgent. In view, furthermore, of the power of antitoxin to prevent laryngeal involvement when the injection can be made in time it is evident that most of the operations will fall within a period not remote from the time of injection of the serum. Of the one hundred and twenty-one tracheotomies in Ronx's report, one hundred and two were performed either before the first injection of antitoxin or within twelve hours afterward: fonrteen between the twelfth and the thirty-sixth honr after inception of the serum treatment, and only five later than thirty-six hours after the injection of the serum. It has already been mentioned that operation may be indicated by the speedy separation of the false membranes in the lower air passages, althongh nsually these separated membranes are expelled by coughing.

Turning now to the results of tracheotomy and intnbation in cases treated with serum, we have in forty-three reports six hundred and eighty tracheotomies with two hundred and sixty-nine

deaths, a fatality of thirty-nine and six-tenths per cent., and three hundred and fifty-three intubations with one hundred and three deaths, a fatality of twenty-nine and two-tenths per cent., and twenty-six intubations followed by tracheotomy with fourteen deaths, a fatality of fifty-three and eight-tenths per cent. In the report of the collective investigation of the Deutsche Medicinische Wochenschrift there are one hundred and five tracheotomies in serum-treated cases, with a fatality of thirty-three and one-tenth per cent. These are not unheard of fatalities from these operations in croup, but they are so low as to indicate decidedly remedial action of antitoxin.

The percentage of fatality from tracheotomy in diphtheria given by Monti from a total of twelve thousand seven hundred and thirty-six cases is seventy-three and three-tenths. The percentage given by V. Hirsch in one thousand six hundred and fifty-four tracheotomies in diphtheria in von Bergmann's clinic in Berlin, during the last ten years and seven months (up to July 31, 1894,) is sixty-eight and seven-tenths. The fatality during the first year of life was ninety-eight and eight-tenths per cent. and sank for each year to the ninth, when it was forty-one and seven tenths, and after this it rose again.

More proper, however, than comparison with these latter percentages is comparison with the percentages of fatality in the same hospital or place from which the respective groups of cases treated with serum are reported. The objections which have been made to comparing the general antitoxin fatality with previous statistics of fatality do not apply, at least not in the same measure, to a comparison of groups of laryngeal diphtheria requiring operation.

If for each group of cases we estimate the number of deaths which would have occurred in the tracheotomized cases treated with serum on the assumption that the previous or simultaneous fatality in cases not treated with serum had obtained, we obtain the following result: The actual percentage of deaths in five hundred and forty-one tracheotomized cases treated with serum was forty-two and one-tenth; the percentage of deaths in these cases estimated on the basis of previous or simultaneous fatality in the same hospitals would be sixty-four and nine-tenths. There was, therefore, an apparent reduction in the number of

deaths by the use of antitoxin of thirty-five and one-tenth per cent. This difference between actual and estimated fatality is greater than is observed in any ordinary experience of variations in fatality during a series of years in the same hospital from tracheotomy in diphtheria.

When one considers that the benefits of serum treatment are most strikingly apparent when the treatment is begun early in the disease, and become more and more doubtful after the third day, and that the great majority of these tracheotomized cases are already the subject of advanced laryngeal stenosis when the antitoxin is first injected, it would not have been a convincing argument against the treatment if these benefits were not conspicuously manifest in cases of diphtheria requiring tracheotomy.

Before the introduction of the serum treatment a collective investigation was set on foot by the German Gesellschaft für Kinderheilkunde to determine the average fatality following intubation. In 1893 von Ranke reported to the Society that one thousand four hundred and forty-five cases of diphtheria with laryngeal stenosis treated by intubation gave a fatality of sixty-two and five-tenths per cent. This result was interpreted in favor of intubation as opposed to tracheotomy. There is a difference of thirty-three and three-tenths per cent. between this percentage and twenty-nine and two-tenths per cent., which is the fatality of our three hundred and fifty-three intubated cases treated with serum. This difference is so great that, after making all due allowance for possible differences in the series of cases comprising the two groups of statistics, it seems impossible to explain it otherwise than as a powerful additional support of the arguments already presented in support of the claims of antitoxin. Here, certainly, the objection that the cases treated by antitoxin were light ones, can not be made.

We are enabled from my table of statistics to compare the fatality of two hundred and fifty intubated cases treated with antitoxin with the fatality estimated on the assumption that the previous or simultaneous fatality from intubation of cases treated without serum in the same hospitals had obtained. By this calculation we find the actual fatality to be thirty-one and six-tenths per cent. and the estimated fatality sixty-two and four-

tenths per cent. In other words, there was an apparent reduction in the fatality of intubated cases of forty-nine and five-tenths per cent. as the result of the serum treatment.

However distrustful one may be of statistical evidence in matters therapeutical, and previous experience justifies much distrust, I fail to see on what credible assumption this striking reduction in the percentage of deaths can be explained otherwise than as demonstrative of the specific curative power of the healing serum in diphtheria.

During the enforced two months' interruption of the serum treatment in Baginsky's service, there were one hundred and sixteen cases of diphtheric laryngo-stenosis with a fatality of sixty-two and two-tenths per cent., as opposed to a fatality of thirty-seven and eight-tenths per cent. in the serum period which preceded and followed the pause. The percentage of operations rose to fifty-five and two-tenths as opposed to eighteen and one-tenth during the periods of serum treatment, and this without any change in the character of the cases admitted. During the serum periods there were more intubations than tracheotomies, whereas during the pause there were forty-five tracheotomies and nineteen intubations, thirteeen of the latter requiring secondary tracheotomy. In Ganghofner's service the fatality of the operated cases rose from thirteen and six-tenths per cent. to sixty-eight and nine-tenths per cent. during the interruption in the supply of serum.

The employment of antitoxin has greatly extended the substitution of intubation for tracheotomy. An agent which would arrest the progressive descent of the diphtheritic process from the larynx into the bronchi and hasten the disappearance of the obstructive exudate, is just what was needed to make intubation the ideal operation for the relief of the great majority of cases of croup requiring operative interference. Such an agent we now possess in antitoxin for a large group of cases.

Serum therapy materially hastens the time when the removal of the intubation tube or of the tracheal canula is permissible.

Of three thousand two hundred and eleven not operated cases of diphtheria treated with antitoxin in my collection of statistics, three hundred and fifty-three died, giving a fatality of eleven per cent. As has already been stated many cases of

laryngeal diphtheria are included among the cases not operated upon.

In Roux's report the previous fatality of non-operated cases averaged thirty-three and nine-tenths per cent. as opposed to twelve and eight-tenths per cent. under the serum treatment; in Baginsky's thirty-one and six-tenths per cent., versus ten and nine-tenths per cent.; in Bokai's thirty-four and five-tenths per cent. versus fourteen per cent.; in Ganghofner's fifteen and eight-tenths per cent. (the lowest in a series of years) versus twelve per cent.; in Van Nes' thirty-three per cent. versus thirteen and three-tenths per cent.; in Leichtenstern and Wendelstadt's fifteen per cent., versus ten and four-tenths per cent.

Age is a factor of such prime importance in the prognosis of diphtheria that I have prepared tables in which the cases treated with serum are classified according to age. I must refer to the article already mentioned for the study of these tables, and on this occasion I will make only the following extract of one of the tables:

| | 0–2 YEARS. | 2–4 YEARS. | 4–10 YEARS. | 10–15 YEARS. | OVER 15 YEARS. |
|---|---|---|---|---|---|
| Cases, . . | 263 | 411 | 681 | 129 | 40 |
| Deaths, . | 86 | 84 | 95 | 11 | 2 |
| Percentages, | 32.7 | 20.4 | 13.9 | 8.5 | 5 |

There were under one year of age thirty-five cases with sixteen deaths, or forty-five and seven-tenths per cent.

The most frequently quoted percentages of fatality in diphtheria according to the age of the patients are those of Herz, and are as follows:

| | |
|---|---|
| Under 1 year, . . | 80 per cent. |
| 1–3 years, . . . . | 45 per cent. |
| 3–5 years, . . . . . | 40 per cent. |
| 5–10 years, . . . . | 17 per cent. |
| Over 10 years, . . . . | 17 per cent. |

V. Hirsch's statistics of two thousand six hundred and fifty-eight cases give the percentage of fatality for diphtheria under one year as eighty-eight and three-tenths, and from one to two years as eighty-two and five-tenths. In Baginsky's service the average percentage of fatality of cases under two years before the introduction of the serum treatment was sixty and two-tenths; under the serum treatment it was twenty-two per cent.

The contrast between a fatality percentage of thirty-three and three-tenths for cases of diphtheria under two years of age treated with serum and that of sixty to over eighty for cases of the same age under ordinary treatment is a striking one, even if a large allowance be made for possible differences in the characters of the cases in the two groups.

In the report of the collective investigation by the Deutsche Medicinische Wochenschrift, already referred to, the fatality of seven hundred and thirty-five cases under two years of age treated with serum is twenty-one and eight-tenths per cent., as opposed to a fatality of thirty-nine and seven-tenths per cent. in four hundred and ninety-eight cases treated without serum; the corresponding percentages for ages between two and ten years is eight and eight-tenths versus fifteen and two-tenths; whereas the percentages in cases over ten years of age are four and one-tenth for serum and three and seven-tenths without serum. These results would indicate that the benefits of the serum treatment are greater in infants than at a later period. I think that this is probably the case, but other reports show that adults are also benefited.

Behring claims that no deaths will occur from diphtheria if antitoxin is injected in sufficient dose at the beginning of the disease, and that the fatality will fall under five per cent. if the treatment in proper manner is begun before the third day of the disease.

Of course the only significance of this great emphasis upon the importance of early treatment is as an expression of the fact that cure is rendered more difficult the larger the number of the diphtheria bacilli, the greater the amount and intensity of their accumulated toxins, the greater the damage already in-

flicted by the bacilli and their toxins and the more serious the complications and secondary infections. There is, however, no absolute parity between the length of time the disease has lasted before beginning treatment and the increase of these dangers. One case may become desperate within forty-eight hours after the onset and another may present no grave symptoms after a week's duration. The virulence, the number and the microbic associations of the infecting bacilli and especially the local and general susceptibilities of the patient are factors no less important in determining the issue than the single factor of time.

The individual peculiarities of each case must be considered. If all are judged according to one simple, uniform standard—antitoxin cures the case or it does not cure the case—and it must be confessed that this is all which seems to be in the minds of many, then the practitioner will not come to any clear conception of the wonderful powers of the healing serum. Incredible as it may seem, there are observers who lump together indiscriminately all of their cases, including those complicated with scarlet fever, measles, tuberculosis and other diseases, the mixed infections, the anginas, the croups, the advanced and the early cases, the false and the true diphtherias, the infants and the adults, and throw them into the antitoxin scales. An unsuccessful case is put down to the discredit of antitoxin without reference to its peculiarities. Even such brute figures can not hide the merits of the serum treatment, but reports of personal experience with this treatment should at least contain the data for an intelligent analysis of the cases treated.

There is, of course, in many cases considerable uncertainty as to the exact duration of the disease at the time when a diphtheric patient is first seen by the physician. This is particularly true in hospital practice where most of the patients are the children of laborers. A tabulation of cases of diphtheria according to the day of beginning treatment will be, therefore, only of relative value, but we can fairly assume that the duration of the disease will rarely, if ever, be shorter but often longer, than that stated.

I will make the following extracts from my tables in which

the cases treated with serum are classified according to the day of the disease on which the antitoxin was first injected.

| | TOTAL. | 1ST AND 2ND DAY. | 3RD AND 4TH DAY | AFTER 4TH DAY. |
|---|---|---|---|---|
| Cases, | 1702 | 814 | 534 | 286 |
| Deaths, | 229 | 45 | 81 | 91 |
| Percentages, | 13.5 | 5.5 | 15.2 | 31.8 |

Of two hundred and thirty-two cases in which serum treatment was begun on the first day, five, (two and fifteen one-hundredths per cent.) died; of four hundred and ninety-two cases in which treatment was begun on the second day, thirty-eight (seven and seven-tenths per cent.) died; of three hundred and thirty-one cases in which treatment was begun on the third day forty-three (thirteen per cent.) died.

In one thousand one hundred and fifteen cases treated with antitoxin during the first three days of the disease the fatality was eight and five-tenths per cent., whereas in five hundred and forty-six cases in which the treatment was begun after the third day of the disease the fatality was twenty-seven and eight-tenths per cent.

It will be noted that the percentage of deaths in cases in which the serum treatment is begun on the third and fourth days of the disease is nearly three times greater than that in cases treated on the first and second day, and the percentage after the third day is three and one-quarter times greater than that for cases treated within the first three days.

Of the five fatal cases in which it is alleged that the treatment was begun on the first day of the disease, in not one is the assumed duration of the disease certain. In only three of these cases are details given as to the condition of the patient on admission and each of these three cases was apparently far advanced on admission, presenting extensive membranous deposits, cyanosis and very bad general condition, so that the reporter does not consider the statements of the parents as to the

duration of the disease trustworthy. In another of the fatal cases the patient died after the diphtheria had disappeared, from complications, but it is not stated that the complications were referable to the diphtheria. I am not aware of the report of any fatal case properly treated with serum within the first twenty-four hours after the beginning of the disease in which the duration was positively determined. Possibly a case reported by Ritter may be such, as he says that the child had been taken sick only a few hours before the beginning of treatment.

The following case may be quoted as a good illustration of the uncertainty, under even intelligent observation, of exact determination of the day on which the attack begins. Kurth relates that a twin brother of a child ill with diphtheria was found to present small membranous patches on the tonsils which during two weeks of observation would at times disappear, and which did not apparently make the child ill. Loeffler bacilli were demonstrated, but the parents would not consent to the injection of serum. At the end of fourteen days laryngeal diphtheria suddenly developed. The injection of antitoxin was followed by recovery in four days. This is simply a type of not a few cases which are regarded as suddenly developed laryngeal diphtheria.

It is noteworthy that the percentage of deaths in eight hundred and fourteen cases in which treatment was begun before the third day of the disease is only five and five-tenths.

If we make allowance for the fact that the assigned duration of the disease can scarcely be shorter but may readily be longer than the actual duration, then my tabulation of one thousand seven hundred and two cases of diphtheria according to the day of beginning treatment harmonizes with Behring's original prediction. Still I do not consider it justifiable to draw definite conclusions as to exact percentages from so small a number of cases.

As is well known the fatality from diphtheria by any approved method of treatment is smaller, the earlier in the disease the treatment is begun. This is clearly shown in the statistics of V. Hirsch of the cases treated in the surgical clinic in Berlin during ten years. The following are his percentages: first day,

eighteen and three-tenths; second day, twenty-two and seven-tenths; third day, thirty-eight and one-tenth; fourth day, fifty-three and six-tenths; fifth day, sixty-seven; sixth day, sixty-seven and four-tenths; seventh day, seventy-two and five-tenths; eighth day, eighty-one and six-tenths.

Philip has reported from Baginsky's service the results of treatment, before the use of serum, begun in the earliest stages of diphtheria, the patients being brothers and sisters of children with diphtheria. These brothers and sisters were examined for Löffler bacilli so that opportunity was given for recognition of the disease at its onset. The fatality was ten and five-tenths per cent. lower in these cases recognized and treated early than in the others. The fatality of the cases treated by Baginsky with serum during the first three days of the disease was thirty-two and two tenths per cent. lower than the preceding average fatality of cases treated without serum. Plainly some more potent healing factor than merely that of early treatment was present. The only difference in the methods of treatment of the two groups of cases was the use of antitoxin in the one and its absence in the other.

Kohts of Strassburg, an opponent of the serum treatment, at the recent congress for internal medicine in Munich, claims for his method of local treatment no deaths among cases treated on the first day of the disease. For later days his percentages of deaths are much higher than those in the serum statistics. His percentages are: first day, naught; second day, twenty per cent.; third day, forty-seven per cent.; fourth day, fifty-five per cent.

We are of course not to infer from these results that antitoxin may not be beneficial when injected after the third or fourth day of the disease. There are cases which are still mild after this duration but which subsequently become serious and even in desperate cases antitoxin holds out some hope of cure.

It is apparent that the largest proportion of cures by antitoxin is to be expected from private practice among those who call the physician in at an early stage of the disease. While a similar statement may be made concerning any other suitable method of treatment, it is not, I believe, true in the same measure as for the serum treatment.

There has been much diversity of opinion as to the specific effects following injection of the healing serum, and I shall present briefly the principal points which seem to me to be established.

Most writers approve of the continuance of such measures of local and general treatment as have hitherto been found to be useful, but recommend the avoidance of all irritating and caustic local applications.

The injection of the serum may be followed in a few hours by local pain, swelling and redness, but there is no danger of abscess formation if the serum is uncontaminated and proper antiseptic precautions are taken. In over three thousand injections Martin observed the formation of an abscess only three times.

In twenty-four to forty-eight hours after the injection the general condition of the patient is remarkably improved in the great majority of those patients who are in a condition to be benefited at all by antitoxin. This general improvement is accompanied by a fall of temperature, which may be a critical fall, especially if the disease is not far advanced; often it is a fall by lysis. Some hold that there may be a temporary rise of temperature as an immediate effect of the injection. Accompanying the fall of temperature is improvement of the pulse as to frequency and tension, but the heart's action may for some time, even into the period of convalescence, remain weak.

In the favorable cases the local diphtheritic process is arrested, usually within the first twenty hours after the injection. Membrane may appear upon spots previously inflamed and invaded by the bacilli, but otherwise there is no extension of the membrane in the majority of the cases which are benefited. The area covered by membrane becomes sharply demarcated and the swelling of adjacent mucous membrane disappears. The membrane may disappear by rapid separation or by gradual softening. Sometimes it persists for several days after disappearance of all other local disturbance. Large membranous casts are coughed up from the larynx, trachea and bronchi under the serum treatment more frequently than under former methods. The rapid separation of the membrane in the lower air-passages may cause sudden increase of stenotic symptoms.

Nasal discharge is lessened. The swelling of the glands in the neck and the surrounding edema disappear, so far as these are not referable to secondary infections.

The most uncertainty prevails as to the influence of antitoxin in preventing the three most important complications or sequelae of diphtheria, nephritis, heart failure and paralysis. The weight of evidence is that genuine nephritis is far less common in cases treated by antitoxin sufficiently early than under other methods of treatment, but it is questionable whether albuminuria is less common, although it is considered to be by Kossel, Roux, and others. If there is an albuminuria in any way directly referable to the injection of the serum, and this is by no means established, it is simple albuminuria with perhaps a few narrow hyaline casts, but without evidence of any serious damage to the kidney. Peptonuria, it is claimed by Hecker, is an effect of the serum, but it is without clinical significance. Albuminuria is such an extremely common symptom of diphtheria that it must be very difficult to determine that it can be referred to the serum in any case.

Many writers emphasize especially the favorable influence of antitoxin upon the heart, but there are some who have observed that with decided improvement in all other symptoms the force of the heart may still remain weak and occasion anxiety. Baginsky's experience is that the minor disturbances of the cardiac action are not less frequent in cases treated with serum, they appear to be even more frequent as a larger number of cases survive, but that actual death from heart failure is far less common in the serum cases than in others.

Post-diphtheric paralysis may occur in cases treated with serum as early as the second or third day of the disease. Whether they occur in cases treated within the first twenty-four hours is not certain. Probably they do not. According to some, paralysis is even more common in the serum cases than under former methods of treatment. This is doubtful, but if true, it may be attributed to the survival of a larger proportion of cases.

It is apparent from what has been said that antitoxin is most strikingly beneficial in progressive fibrinous diphtheria and especially in the prevention and cure of laryngeal diphtheria. In developed septic diphtheria the serum treatment is of little avail. In the prevention of sepsis it is most useful.

Antitoxic serum may produce unpleasant effects, but these do not involve danger to the patient. They are, in all probability, referable to the serum as such and not to the healing, so called, antitoxic substance contained in the serum. The most common undesired effect is some form of exanthem, usually erythema and urticaria, sometimes an eruption like measles or scarlatinal rash. The same exanthems have been observed by Bertin after the injection of ordinary serum of the horse, and by Richardière after injection of Marmorek's anti-streptococcus serum.

The serum from some horses is more likely to cause these exanthems than that from others, and there may be individual idiosyncrasies favoring their occurrence. Some writers report the occurrence of an exanthem in not more than five per cent. of their cases, others have observed them in over fifty per cent. of the cases treated with serum. They may be localized in the neighborhood of the seat of injection, or extend from that over the greater part of the body, or make their first appearance at a distance from the point of injection. Often without noticeable fever they may be accompanied by considerable elevation of temperature and by pain and swelling in the joints. A rarer but more severe form of serum exanthem resembles erythema multiforme, and when this is accompanied, as it may be, by high fever and severe pain in the bones and joints, with swelling of the joints, the condition of the patient may really seem serious, but these patients recover. Some have attributed a petechial eruption to injection of the serum, but this may occur in diphtheria without serum treatment.

These occasional untoward effects of the healing serum are annoying, but, being unattended with danger to life and without serious consequences, they do not contraindicate the use of the serum.

There have been a few cases reported in which the writers without satisfactory evidence have referred the death of the patient to the use of the serum. The essential harmlessness of the serum has been demonstrated by over a hundred thousand injections,* and if future investigations should show that through

*This would seem to be at least a moderate estimate, as writing November 20, 1894, Behring says that there had been up to that date certainly over forty thousand injections. (Das neue Diphtherieheilmittel, von Dr. Behring, Berlin, 1894, p. 25).

some idiosyncrasy on the part of the patient death ever is attributable to the injection of the serum, this would probably count for about as much as the rare deaths from the use of ether or chloroform.

I shall leave untouched the question of the immunizing properties of antitoxin.

The principal conclusion which I would draw from this paper is that our study of the results of the treatment of over seven thousand three hundred cases of diphtheria by antitoxin demonstrates beyond all reasonable doubt that anti-diphtheric serum is a specific curative agent for diphtheria, surpassing in its efficacy all other known methods of treatment for this disease. It is the duty of the physician to use it.

The later reports show, in general, a decided improvement in the results of the treatment over the earlier ones, and there is every reason to believe that the results of the second year's employment of the new treatment will make a much more favorable showing than those of the first year. We shall come to a clearer understanding of the mode of action of the healing serum. Improvements in the methods of preparation and preservation of the serum and possibly the separation of the healing substance, at least from other ingredients which produce the undesired effects, may be expected.

The discovery of the healing serum is entirely the result of laboratory work. It is an outcome of the studies of immunity. In no sense was the discovery an accidental one. Every step leading to it can be traced, and every step was taken with a definite purpose and to solve a definite problem.

These studies and the resulting discoveries mark an epoch in the history of medicine. It should be forcibly brought home to those whose philozoic sentiments outweigh sentiments of true philanthropy that these discoveries which have led to the saving of untold thousands of human lives have been gained by the sacrifice of the lives of thousands of animals, and by no possibility could have been made without experimentation upon animals.

# SURGICAL PAPERS.

# REPORT ON THE PROGRESS OF SURGERY.

BY LEONARD WOOLSEY BACON, JR., M.D.

*Mr. President and Gentlemen of the Connecticut Medical Society:*

This report on the Progress of Surgery, which I have the honor to present to you, is confessedly but a compilation from current medical literature and contains but little besides quotations, in many cases literal, from the reports of others. On account of the defection of my colleague, necessitated as he has written me, by pressure of professional work, I have left to me a field far too broad to be covered by one paper. I nevertheless deemed it incumbent on me to lay out my work so as to cover as much of the ground as possible, and divided my subject into the following heads, though even with this imperfect classification of the work, I am compelled, from lack of space and time, to omit entirely some interesting facts I have collected on the subject of genitourinary surgery, including the consideration of the valuable work of Weir in the surgery of the bladder, ureters and kidney, new and interesting points in operating for varicocele and for phimosis, and some radical and novel changes in the treatment of gonorrhea, as well as a report on the operation of castration for prostatitis, suggested by Dr. J. W. White, of Philadelphia. The treatment of fractures and many miscellaneous surgical operations and procedures I am obliged to dismiss with this bare allusion, though many developments of the past twelve months are well worthy of a hearing, and would add largely to the completeness and interest of this report.

The heads under which I wish to lay this broad subject before you are these:

I. Surgical Technique.

II. General Surgical Processes.

III. Amputations.

IV. Surgery of the Head and Neck.

V. Abdominal and Visceral Surgery.

## I. SURGICAL TECHNIQUE.

Henry O. Marcy says: "We now find the danger likely to arise from operative procedures not coming, as formerly, from those who do not believe stringent precautions necessary, but rather from the complicated methods employed by the willing follower of modern teaching who has but a superficial knowledge of surgical pathology."

The ritual of surgical technique must be learned in a painstaking manner, that it may become automatic in its application, as much as the speaking of correct English, since, as in speech, the mind should be dominated only by the central thought, and not be distracted by detail. When this is true the disinfected hand will not seek the pocket, the finger the ear or face, and the infected instrument or sponge will be discarded.

DISINFECTION OF THE HANDS. The disinfection of the surgeon's hands must be the first care. The reason why the older method of disinfection by scrubbing with soap and water and dipping in one to one thousand bichloride solution, is deemed insufficient, is two-fold. First, certain pathogenic germs have their normal habitation in the deeper epithelium of the skin and are not reached by this process. Secondly, hands aseptic at the beginning of a long operation, may become sufficiently macerated before its close to loosen the deeper, non-sterilized cells, which may be rubbed off and lodge pyogenic material in the wound. To meet this difficulty the modern recommendations are various.

METHOD OF FÜRBINGER. The method of Fürbinger, in Germany, commends itself, but for the expense, and consists in intercalating between the soap and water scrubbing and the dipping in bichloride solution, the soaking of the hands in alcohol of at least eighty per cent. Alcohol acts by dissolving sebaceous substance on the surface of the skin, and enabling the bacteria which adhere to it, to be easily washed away or destroyed.

REINECKE'S METHOD. Reinecke, of Leipzig, maintains that the hands may be surely disinfected by rubbing with alcohol only, washing them afterwards with sterilized water.

METHOD OF ROBB, OF JOHNS HOPKINS. The method which has found most favor with American surgeons is, however, that

of Dr. Robb, of Johns Hopkins, wherein a saturated solution of potassium permanganate is used as an indicator, and the actual disinfection is performed by a saturated solution of oxalic acid, applied until the stain of the permanganate is removed. Any method of disinfection of the hands should be followed by rinsing with sterilized water, and should be supplemented with occasional rinsing in disinfecting solution during the course of any long operation.

### DRAINAGE.

Drainage is less and less resorted to as surgical technique has improved. The leading surgeons, who a few years ago, drained ninety per cent. of all wounds, now drain but from ten to fifteen per cent., recognizing that the presence of the staphylococcus albus in the skin is a constant menace to a wound kept open by a drainage-tube. Whereas surgeons used to be afraid to close an abdominal wound completely, on account of sepsis, they now close it in every case possible, and rather hesitate, *from fear of infection*, to drain the wound. The place of the drainage-tube is taken by buried animal sutures, closing every pocket and sac of the wound by suturing in layers, as far as possible.

DUSTLESS ATMOSPHERE. A valuable suggestion by Dr. Marcy, of a way of securing a dustless atmosphere is the vigorous shaking, by two persons, of a sheet wet in strong mercuric solution, which throws a cloud of finely divided particles of water into the room. These, in settling, carry down all dust. He recommends that if an emergency operation must be done at once, in a carpeted room, that no sweeping or dusting be allowed, but that the shaking of wet sheets and the covering of the carpets with the same, will be the most apt to give you an aseptic room.

TEMPERATURE OF OPERATING ROOM. A high temperature in the operating room, in severe operations, is emphasized as necessary, and an operating table, which by a false top, admits a receptacle of hot water, is recommended by Dr. Marcy, as a means of furnishing heat to the patient.

### ANESTHETICS.

COCAINE. Krogius describes a new method of producing cocaine analgesia, which is based on the fact that when a solu-

tion of this agent is injected into the subcutaneous tissue near a nerve-trunk, it causes loss of sensation over a large zone, corresponding to the peripheral distribution of this nerve. In order to reach the affected nerve-trunk with certainty and to apply cocaine to several of its branches at the same time, the author, in injecting the subcutaneous tissue, passes his needle across the long axis of the limb, and as the needle is thrust along the solution is gradually discharged. An injection made in this way, across the root of a finger, will in the course of ten minutes result in the analgesia of the whole digit, not of the skin only, but also of the tendons, the periosteum and all the deep structures. Injections over the ulnar nerve above the elbow abolish sensation over the ulnar side of the hand as far as the roots of the last two fingers. The author uses a two per cent. solution and enjoins recumbency for at least a quarter of an hour.

This principle of the anesthesis of the peripheral distribution of a nerve-trunk may also be employed advantageously in using freezing mixtures, such as chloride of ethyl, etc.

### DRESSINGS, LIGATURES, ETC.

CATGUT. Regarding the sterilization of catgut, I find three new methods recommended, one of which especially commends itself.

METHOD OF PROF. M. SCHÜLER, OF BERLIN. First: Catgut is placed in a wide-mouthed bottle containing oil of lavender, an ethereal oil free from oxygen. The bottle is to be filled up to the stopper, which latter is to touch the surface of the oil. Any catgut not submerged becomes brittle. The bottle, hermetically sealed, is placed in a steam sterilizer for half an hour, (temperature one hundred and six degrees to one hundred and ten degrees C.). The catgut is supple and does not tear. The same lavender oil can be used repeatedly.

WILLIAM G. BISSELL'S BICHLORIDE METHOD. Second: William G. Bissell's "bichloride method" is as follows: Place the raw gut in a one to one thousand ethereal solution of bichloride for six to twelve hours, according to size of gut, then wind on sterilized glass spools and place spools and gut in the same solution for six hours longer. Wash in pure ether, then boil in absolute alcohol at atmospheric pressure ten minutes, the object being to

remove all traces of bichloride. Exposure to stronger solutions or for a greater length of time injures the strength of the gut.

DR. R. H. CUNNINGHAM'S FORMALIN METHOD. Third: The third method of preparing catgut was first reported to the N. Y. Academy of Medicine as recently as the eighth of last month (April), and time enough has not elapsed for wide expressiou of opinion and testing. If found reliable it is certainly a great advance. Take commercial catgut, wound, not too tightly, on a glass spool, soak it two days in a mixture of absolute alcohol and ether, equal parts, and thoroughly remove the grease. Theu immerse in alcohol a few moments. Then remove to a jar with a tight cover in which there are equal parts of formalin, alcohol, and boiled distilled water sufficient to submerge the catgut. After two days (a few hours would probably do) the catgut can be removed, the formalin washed out, the catgut soaked several times in fresh alcohol, or better, *boiled in normal saline solution half an hour or more*, then transfer to alcohol for preservatiou uutil used.

Catgut so treated was found to have uudergone a peculiar change, so that it did not become stiff and brittle and *even on boiling in water several hours* it did not lose its strength.

The fact that it can be boiled without destroying it is very important, for a number of reasons:

1ST. It facilitates the complete removal of the irritating formalin.

2ND. A more surely aseptic state is produced.

3RD. It can be again boiled iu saline solution just before using it.

Other animal substances, such as decalcified bone, can be thus prepared also.

PEAT-FIBRE. Peat-fibre, as now prepared for surgical purposes, is a fine, brown, glossy wool, with a faiut aromatic odor. It feels a little rougher than fine absorbent wool, but makes a more comfortable dressing, as it is much more elastic. Its chief advantage seems to be that it is a deodorant.

IODOFORMIZED LAMP-WICKING. At my suggestion, the J. Elwood Lee Co. have prepared iodoform lamp-wicking in a manner similar to the well-known iodoform gauze. The readiness with which it can be used for packing cavities with a minimum of handling and cutting with shears I think will commend it to the profession.

DUSTING POWDERS.

ACETANILID. Acetanilid is being used a great deal as a dusting powder in surgery. It is a good substitute for iodoform in venereal sores. The only thing experienced on its application to a granulating surface is a burning sensation, which, however, persists only a short time. It is useful in the dressing of all forms of burns, ulcers, moist eczema, gunshot wounds, abscesses, etc. When applied to extensive granulating surfaces it sometimes produces cyanosis, which is not due to a disturbance of the circulation, but to a deficient oxygenation of the blood. Acetanilid is cleanly, odorless, antiseptic, dessicating, practically non-toxic, does not crust, is easily removed, insignificant in cost, and not altered by moisture.

It has been used extensively and with considerable satisfaction in the surgical clinic of the New Haven Dispensary and in private surgical practice in the city.

SULPHUR. Another substitute for iodoform is sulphur. Mr. Arbuthnot Lane reports to the Royal Medico-Chirurgical Society his experience in the use of it. He began this about a year ago in disease of the hip-joint and found that it produced a sharp caustic effect on the tissues, with escape of sulphuretted hydrogen. He reported cases of extensive tubercular disease of elbow, knee, tarsus, prostate and spine, of septic gangrene of leg, of lupus and of carbuncle. He found he could sterilize healthy tissues so far as organisms are concerned by applying the powder for twenty-four hours, but in granulating parts, or such as were badly supplied with blood, as, e. g., the brawny edge of carbuncle or spreading gangrene, a much longer time was required. No doubt the sulphur is slowly oxidized and sulphurous acid is the real disinfecting agent. Some of this is further oxidized and the sulphuric acid which results is responsible for the caustic action observed.

Still, as Mr. Lane found the dressing painless, the caustic acid must be formed very slowly and to only a slight extent. There are, no doubt, cases in which the sulphur in powder is not only the most convenient dressing, but in which the gradual evolvement of the sulphurous and even of the sulphuric acid may be most effectual.

## II. GENERAL SURGICAL PROCESSES.

NUCLEIN. Tentative work is being done in some quarters as to the surgical uses of nuclein and nucleinic acid and a large manufacturing house is seeking to draw the attention of the profession to the value of a preparation they call proto-nuclein. Dr. Victor C. Vaughn, of Ann Arbor, has made contribution to our knowledge of the chemical, physiological and therapeutic qualities of nuclein. It seems to have a powerful germicidal effect, stimulating the reproduction of certain cellular elements and promoting possibly phagocytosis. Its local use has been suggested in indolent ulcer, certain forms of surgical tuberculosis, and in malignant neoplasms. Clinical reports as to its usefulness have so far been but few.

ERYSIPELATOUS VIRUS. The reports as to the efficiency of the toxines of erysipelas in the treatment of malignant neoplasms are, on the contrary, numerous and most encouraging. A curious contradiction seems to obtain, however, between the achievements of Dr. Coley, the originator of the method, and the results obtained by others working under apparently similar conditions. Whether the difference lies in the selection of cases or not it is difficult to say. One thing worthy of comment is that the successful cases reported by Dr. Coley are almost all those of patients under forty years of age and that the tumors have been most of them of comparatively recent growth, though many of them of extreme malignancy and large size. Through the courtesy of Dr. William H. Carmalt, it was my privilege to observe one of the first cases on which the treatment was tried in this State. The case was one of generalized sarcoma in a German, between forty and fifty years of age. Dr. Coley wrote me at the time he sent the toxine that he could not expect favorable results from treatment. The patient who, strange to say, was not profoundly cachectic, had several hundred sarcomatous nodules on different parts of the body, varying in size from that of a pea or smaller, to that of a walnut, and also two large tumors on the inner aspect of the left thigh. The injections, varying in size from m. i. to m. x of the unfiltered toxines of bacillus prodigiosus and streptococcus-erysipelatis, produced sometimes a reaction in

temperature amounting to one hundred and five degrees F., and sometimes no appreciable reaction, the difference not apparently depending on the size of the dose. Sloughing and breaking down occurred in one of the tumors on the thigh, and the other tumor on the thigh became somewhat less tense and hard. Under daily injections this much was accomplished in a week. During a second week, in spite of a progressive increase in the size of the injection, no further improvement became manifest. After a little over two weeks the patient declined further treatment and left the hospital. A few weeks later he died. No autopsy was obtained. From the portions of tumor which sloughed away and from sections of a small nodule removed by the knife for microscopical examination, the diagnosis of sarcoma was established beyond a doubt. This case showed a decided influence of the toxine upon at least one of the tumors, but as treatment could not be continued, it cannot be considered as of much demonstrative value.

A second case, one of sarcoma of the tonsils, gave a negative result after injections. These two cases were both under treatment at the New Haven Hospital.

The latest report from Dr. Coley is under date of May 18th. He began this treatment of multiple sarcoma by repeated injections of living cultures of erysipelas streptococci in 1891. In 1892 he experimented with bouillon cultures, prepared by heating to one hundred degrees C., and the effect was slightly less than when living cultures were used. Early in 1893 he began using cultures filtered through porcelain without subjecting them to heat. The toxines of the bacillus prodigiosus prepared in the same way, were used in conjunction with the erysipelas toxines, which intensified the action of the erysipelas toxines on the sarcoma, and was much more effective than that of the erysipelas toxines alone. The two cultures he later grew together and subjected to heat. Fifty-eight C. is sufficient to kill the germs without destroying the chemical toxin, and no loss occurs as in filtration. After subjecting to heat, sufficient thymol was added to make a saturated solution. This was the form of virus used in the first case detailed above.

A further improvement reported this week consists in first

subjecting animals to the action of the erysipelas for a time, and then employing the blood-serum of such animals instead of the toxin directly. This does away with the severe reactions and depressing effects that follow the injections of the toxines.

Favorable results are reported in the treatment of carcinoma as well as sarcoma. Dr. Coley also reports cases treated independently, in Germany, with erysipelas serum. Here good results were obtained, both in sarcoma and in carcinoma. The German observers say: Small doses (of erysipelas serum) [5 c.c.] produced no pain. After repeated injections there was light drawing pain, lasting only a few hours, even after injections of 10 to 20 c.c. In no case was the pain sufficient to require medicine. In most cases there was no fever. In no case did the temperature exceed one hundred and two degrees F. No patient complained of headache, anorexia, etc., as a result of the injections. On the contrary, the favorable effect of the serum on the general condition of the patients was very striking. After the injection of small doses of an active serum, either at once or after a few hours, there appears a false erysipelas, an aseptic erysipelas consisting of more or less swelling of the skin, with slight redness. The degree of redness is always less than that of true erysipelas. This erysipelatous swelling extends beyond the limits of the tumor, but naturally does not spread of itself, and disappears entirely in twenty-four or forty-eight hours after the injections are discontinued. The stronger this pseudo-erysipelas swelling, the better is usually the curative effect of the serum.

METHYL VIOLET. Two new methods are advanced for the treatment of ulcers; one the use of a solution of methyl violet, gr. iss, to the ounce of distilled water, painted on to the ulcer, particularly recommended in painful varicose ulcers, the limb being furthermore treated with a compressive bandage.

OXYGEN GAS. The other method is to be applied to the treatment of any wound, but conveniently used, I should think, only in wounds or ulcers of the extremities. The method consists in keeping the part of the limb on which the wound or ulcer is present in an air-tight box, into which oxygen gas is introduced. The idea is to use the stimulating effect of oxygen gas on a granulating surface, the prima-facie idea not being one of antisepsis.

The method is too cumbersome and expensive to come into use.

DRY AIR IN CHRONIC JOINT DISEASE.

A much more reasonable application of a somewhat similar apparatus is the Tallerman-Sheffield local dry hot air bath for the treatment of chronic joint affections. This is an invention by which dry air at temperatures from two hundred and fifty degrees to three hundred degrees F. is applied to a portion of the body, such as hand or foot, arm or leg. By an arrangement of outlets at the top and bottom of a copper cylinder, with india-rubber heads, it is found possible to keep the air in the chamber practically dry throughout the operation, notwithstanding the moisture thrown off by the limb inclosed. The cylinder is heated by gas burners placed underneath. Precautions are taken to prevent the skin from coming into contact with the heated metal.

The first effect of the heat is to induce a copious diaphoresis and the circulation of the blood in the part is enormously increased, as is well shown by the bright redness of the limb when removed from the bath. The anodyne effect is often remarkable. Pain is not only relieved, but entirely removed, so that the patient expresses the great relief he feels and moves the limb with much greater freedom and with much less pain. The cases that appear to be most likely to be relieved by the treatment are sprains, stiff joints (where there are no very strong adhesions), flat-foot, gonorrheal rheumatism, acute and chronic gout, chronic ulcers and rheumatism. It deserves also to be employed for its anodyne effect after forcibly breaking down under anesthesis, adhesions which have formed in or about a joint; if the limb be placed in the cylinder, the pain which is generally severe, is greatly lessened and the secondary stiffness is much diminished.

SUPPURATIVE JOINT DISEASE IN CHILDREN.

Dr. H. L. Shively, N. Y., says: The proper management of suppuration in the various phases of chronic joint disease necessitates a discrimination between cases developing in children and in adults. In the child the processes of growth and repair are more active, complicating pulmonary disease is less frequently present, there is less danger of amyloid visceral changes; and

on the other hand the invasion of the joint by operative procedures, where it involves destruction of the epiphyses, results in progressive shortening of the limb as the child grows and is thus more serious than similar operations on the fully developed limb. Clinically the organism of the child is found to be better able to cope with the ravages of the tubercular infectiou; the prognosis of phthisis is usually better, and throughout it is generally observed that localized tuberculosis runs a more benign course in childhood. Again, the disease in joints and bone may be considered as more nearly resembling tubercular adenitis than tuberculosis of other organs, the histological elements of bone, especially the spongy portions and the serous surfaces of joints being closely akin to the lymphatic system in which phagocytosis and other natural eliminative aud conservative processes are most active. For this reason, possibly, the bacilli are so often difficult to detect in bone and joiut disease and the prognosis of uncomplicated tuberculosis iu these parts as in the lymphatic glands is relatively much better than in other organs.

All these considerations call for conservative methods, especially in children, and the avoidance, except as a last resort, of mutilating operations, which are more often justifiable and necessary in adults. With proper support, mechanical treatment, with due observance of good hygiene and nutrition, tuberculosis of joints, even iu the suppurative stage in children, will rarely require other meaus. Indeed, the occurrence of abscesses when rightly cared for, can hardly be said to exercise any unfavorable influence on the ultimate termination of the case.

In conclusion: both on theoretical aud clinical grouuds, treatment for children should differ from that appropriate in adults. Conservative methods are usually successful and their trial is to be persisted in longer in children. Relief from weight-bearing is as much indicated for the knee and ankle as for the hip where destructive disease is present. Exceptiug when near joints or causing injurious pressure, tuberculous abscesses should not be opened. Radical operations are seldom, if ever, necessary in children.

MULTIPLE OPERATIONS. Dr. George R. Fowler, in discussing the question of multiplo surgical operations, reported to the Brooklyn Surgical Society a case in which nine operations were

performed upon one patient at a single sitting: Curettage, amputation of cervix uteri, trachelorrhaphy, anterior elytrorrhaphy, colpo-perineoplasty by flap-splitting, double oöphorosalpingectomy, enterorrhaphy, appendicectomy, and gastrohysteropexy. Time from beginning to end of anesthesia, one and one-half hours. Eleven ounces of ether. Complete recovery.

BOILING ABSCESS CAVITIES.

Jeannel, of Toulouse, employs a method in the treatment of localized tuberculous lesions, such as abscesses, ulcers, osseous and joint troubles with boiling water as a cauterizing and bactericidal agent. The method is applied as follows:

After having freely opened the seat of mischief and slit up any sinuses that may exist, he excises if the lesion involves a joint. All the caseous detritus is then removed by curetting and thorough sponging of the parts, all bleeding being arrested. Then salt solution, maintained at the boiling point, is allowed to fill the cavity through a thick rubber tube. The cavity is then afterward filled and emptied until a sufficient degree of cauterization is effected. It will be seen that this modus operandi is only possible in the case of a funnel-shaped cavity, whose sides can be raised and kept apart by tenacula and which is unprovided with counter-openings, a condition frequently enough met with in practice. A second and preferable procedure is also employed by M. Jeannel. This consists in first filling the foyer with cold or tepid salt solution and then raising the liquid to boiling point by introducing into it the blade of a thermo-cautery at red-heat. One minute suffices to fill a cavity the size of a pigeon's egg with boiling water in this way. The thermo-cautery method insures a constant temperature of one hundred degrees C., but it is applicable only in the case of an abscess cavity wide enough to allow the introduction of the blade without touching the parietes. General anesthesia is, of course, necessary, except in cases of small abscesses, when cocaine, locally applied, is adequate. When the patient awakes considerable local pain is complained of, but this disappears the next day. The parietes of the cavity, or the abscess-membrane, as this used to be designated, becomes gray and yields a copious secretion of serous discharge which renders frequent removal of dressings a necessity. In a few days a detergent process is evident, granu-

lations develop, and cicatrization rapidly ensues. Suppuration is rare; in certain cases, indeed, primary union is obtained. The boiling water method is superior to ordinary cauterizing procedures in that it softens, disintegrates and sterilizes the tissues to a greater depth.

TOXICITY OF SCALDED TISSUES.

In this connection it will be well to notice some recent studies on the toxicity of scalded or burnt tissues. Vassale and Sacchi have studied the effects of extracts of parts actually burned or scalded and of the non-affected parts of the same animals on healthy animals of the same or allied species. Their researches show clearly that the juice of parts burnt has a much more toxic effect on animals of the same species than that of the non-burnt parts of the same animals. This last juice in its turn has a toxicity much greater than that of the juice taken from the corresponding parts of a healthy animal, which is, in fact, harmless. All the juices from a burnt animal are highly toxic and generally produce lethal effects, whether injected hypodermically or into the veins of normal animals. The chief pathological effects produced were marked sub-serous hemorrhages, in one case especially marked in the duodenum. Filtration through porcelain somewhat diminishes, but does not destroy the toxicity of the juices; boiling, however, renders them innocuous, which lends support to the view that the toxic principle is an albumose or some substance coagulable by heat. These results are of interest as bearing on the mode of production of the after effects of burns, attributed by Foa as early as 1881, to a process of auto-intoxication.

Reiss has recently studied the effects of the subcutaneous injection of the urine of patients suffering from burns. Such urine was very toxic and it was found that it owed its properties to the presence of bases of the pyridin group. In cases of severe burn he recommended the speedy removal of the sloughed parts so as to minimize the absorption of poisons found in the lesion. Vassale and Sacchi are of a similar opinion. They also recommend the employment of every possible means—such as keeping the burnt limb as low as possible and the application of bandages—to prevent the too rapid absorption of the degeneration products, the toxicity of which they have so fully established.

TURPENTINE TO CORRECT URINOUS ODOR.

I will close this portion of my paper with the record of a slight hint that may prove of great convenience in treating patients with urinary incontinence. Some one, whose name I cannot learn, administers in such cases ten-drop doses of the essence of turpentine three times a day and continues it for several weeks without inconvenience, the remedy being counterindicated only in cases of gastric catarrh and of nephritis. In a short time the disagreeable odor of the urine is replaced by the odor of violets, which turpentine, as is well known, imparts to that secretion.

## III. AMPUTATIONS.

### (A) OF EXTREMITIES.

Dr. W. L. Estes, of Bethlehem, Pa., has given some remarkable statistics of the results of major amputations. During six years when he operated with improved technique in one hundred and eighty major amputations, he had only five deaths, a mortality of two and seventy-seven one-hundredths per cent. These figures include six hip joint amputations. These favorable results he attributed to care in preventing the loss of blood at the time of the original injury, which, as surgeon-in-chief to the Lehigh Valley Railroad, whence a large proportion of his cases came, he had peculiar facilities for enforcing; secondly, to deferring operation until shock was somewhat relieved, operating generally not till twenty-four to thirty-six hours after the injury.

The comparative value of certain details of operation was discussed by the New York Academy of Medicine some weeks ago. Flap-gangrene appeared in nineteen per cent. of skin flaps and in nineteen per cent. also of musculo-cutaneous flaps.

Early secondary sutures, placed at the time of the wound, and drawn together within forty-eight hours afterward, had given good results. Later secondary suturing had been less satisfactory. In discussion it was brought out that an easy way to test the viability of a limb was by making a transverse incision and observing whether hemorrhage followed; if not, the circulation at that point was poor, and one should go higher. Another useful way of determining the viability of tissues through which it was proposed to amputate, was the application of the Esmarch bandage for two to three minutes. After its

removal there would be a blush in the blanched, healthy skin not seen in the diseased or non-vital portion. Follow the outline of the parts which had been white. In aseptic wounds drainage-tubes ought not to remain longer than forty-eight, generally not more than twenty-four hours. Shock was well treated by hot saline infusions, two to three pints.

(B) OF THE BREAST.

The history of last year's contributions to this operation is interesting. We have in the first place the record of a series of cases from the service of Dr. W. T. Bull, illustrating the value of the radical operation as ordinarily performed, consisting in excision of the breast with a liberal amount of skin over it, of the fascia of the pectoral muscle, and of the glands of the axilla embedded in their fat, without reference to the condition of the glands as determined by examination prior to the operation. In two ways this series is remarkable. Of seventy-five cases so treated, where three or more years have elapsed, none have been lost sight of; the percentage of cures is the highest yet recorded, twenty out of seventy-five, or twenty-six and six-tenths per cent. Dr. Bull states that he has uniformly advised against operation in the variety of tumor known as "atrophying scirrhus," occurring in old people, and in the rapidly growing voluminous tumors occurring between thirty-five and forty-five, and described as encephaloid or medullary carcinoma. In so far the cases may be considered as "selected" cases, but in every case operated on but one the diagnosis of carcinoma has been confirmed by microscopical examination.

DR. WILLY MEYER'S RADICAL OPERATION.

Following closely upon this registration of the "high water mark" of achievement by the radical operation as ordinarily performed, comes a proposal from Dr. Willy Meyer, of a most excellently and carefully planned operation, and almost simultaneously therewith a report from Dr. William S. Halsted, of the Johns Hopkins Hospital, giving remarkably good results in a series of fifty cases operated upon in a way accomplishing substantially the same as that proposed by Dr. Meyer.

The advance in pathology which called for this new operation is due to the studies of Lothar Heidenhain, published in Berlin in 1889, who as pathologist, recommended that the pectoral

muscles be extirpated in cancer of the breast from insertion to origin. Numerous operators have since then operated according to Heidenhain's suggestion. The statistical results of these operations will begin to appear in a year or two.

To Dr. Meyer, however, belongs the credit of devising in an exceptionally elegant and simple manner the surgical procedure necessary to accomplish this result. Though he recognizes that the parasitic theory of the etiology is yet unproved, yet his mode of operating takes into account the fact that it may be that cancer is due to a living parasite and gives the patient the full benefit of the doubt.

His operation, the full details of which I cannot give here, is planned, to quote his own words, "*not* to excise the breast tumor in connection with the axillary contents first and *then* to remove the pectoral muscles and clean out the sub and infra-clavicular space, but to extirpate the breast, the contents of the axillary and of the sub and infra-clavicular region, and the pectoral muscles in one mass." In other words, he says farther, "I thought I would try and let the knife never enter into the infected area, but work everywhere around the latter in healthy tissues, of course as far as this may be feasible in such cases."

The extirpation of the pectoral muscles carried out in this way means an addition of about fifteen to twenty minutes to the operation, including ligatures. It saves blood and time to first cut off the insertion of the muscles on the humerus and coracoid process, and then to reflect the muscles downward. The nucleus of the operation is the following rule: "Lift *all* tissue that *may be diseased* out of its bed *in one piece*."

That this kind of radical operation will be "the" operation for the extirpation of cancer of the breast, there can be no doubt. It is proved by Halsted's unprecedented list of cures. He so far records cure in ninety-four per cent. of his cases, including the cases operated up to February 25, 1894, a number which has never been reached by a surgeon before.

It is hardly necessary to point out that it is not right to compare the ninety-four per cent. of Dr. Halsted with the twenty-six and six-tenths per cent. of Dr. Bull, inasmuch as the former figures represent operations down to a period of six months of the time of publication, whereas Dr. Bull's figures both bear on

a greater number of patients and are strictly limited by a three years' test. In fact, Dr. Halsted had but seven cases followed for three years, with three cures—forty-two and seventy-six hundredths per cent.

## IV. SURGERY OF THE HEAD AND NECK.

TREPHINING FOR HEADACHE. Dr. J. Marshall Hawkes reports a case of trephining of the frontal bone for chronic headache, following the indication laid down by Horseley, to trephine in every case where the pain is persistent, localized and has resisted all medical treatment, whether there be any fracture or not.

In this case the headache, which had been of twenty years' duration, originated at the time of a fall, inflicting a cut on the right upper quadrant of the frontal bone, the region to which pain had been referred since. A semi-circular incision was made surrounding the scar, and a slight depression, not over half an inch long, found in the skull. The trephine point was placed here and a disk three-fourths of an inch in diameter removed. This disk was found slightly thickened at its upper margin, where normally, it should have been thinner. The trephine hole was carefully burnished and every rough particle removed. Rapid and complete recovery followed. No occurrence of headache since.

OSTEOPLASTIC CLOSURE OF SKULL DEFECT. An operation for osteoplastic closure of a skull defect is reported from the clinic of Dr. Augustus C. Burnays, of St. Louis. A defect of the left upper portion of the frontal bone was covered over by dense cicatricial tissue, through which the cerebrum could be distinctly felt and seen to pulsate. The radical reduction of the hernia was accomplished by transplantation of a skin-bone flap after a modified König's method.

A double semilunar incision was made in the scalp. The left semilune enclosing the site of the injury and all the cicatricial tissue in connection with it had a posterior convexity. The right semilunne included that portion of the frontal and of the right parietal bone bordering upon the sagittal and coronal sutures and had an anterior convexity. The outer cranial table, underlying the right semilune, was carefully raised by chiselling in

the substance of the diploë without separating it from the pericranium and the skin. To avoid this required great care. The left semilune of cicatricial tissue, with a margin of healthy scalp, was slid over to cover the bleeding surface of the inner table, just exposed by raising the right semilune, while the right semilune containing a portion of the external cranial table, was slid over to cover the original cranial defect from which the cicatricial covering had been just lifted. Rapid and afebrile recovery. Eight weeks after operation: "there is every evidence of progressive, though as yet incomplete, osseous union." "The defect is now covered by bone and the surface shows no depression or elevation, but is perfectly normal." The author concludes: "The operation of osteoplastic closure of skull defects by this method is one which will undoubtedly gain a permanent place in surgery and should be practiced in all suitable cases of hernia cerebri."

CRANIECTOMY. The operation of craniectomy has been advanced to a point of practical perfection in the hands of Dr. Seneca D. Powell, of New York. Twelve successive cases, without a death, is a record which may bring this operation, the utility of which has been deemed more than questionable, into somewhat better repute. Your reporter remembers vividly, at the beginning of his attendance upon surgical clinics, seeing a laminectomy performed in the Blockeley Hospital, in Philadelphia, where, as the laminae were divided by huge bone forceps, the deeply anesthetized patient would almost spring from the operating table whenever the jaws of the ponderous instrument closed in cutting away the osseous covering of the spinal cord. It was then suggested by your reporter that a revolving saw should be used in a dental engine to save the terrible and repeated shocks to the delicate nerve-centers of the cord, whenever it should be necessary to remove the laminae.

A similar thought came to the mind of Dr. Powell when he considered the great mortality attending the operation of craniectomy in the hands of most operators, a mortality which has generally been ascribed to its long duration. When, after his first operation, Dr. Powell found his hands studded with blood-blisters from the use of the instruments, his thought was directed to another cause. The effect of innumerable successive blows

on a nerve-trunk are familiar to all. The bone-forceps, conductor's punch and gouge, the instruments ordinarily used in this operation, produce a series of concussions upon the meninges and brain, and the operation may be deprived of much of its risk if it can be performed in a manner to overcome this series of concussions. With this in view, Dr. Powell had constructed an electric saw which differed from the Robert's electric saw in that the motor giving the power is not combined with the saw; the instrument is thus much lighter and can be handled with the ease of a dentist's drill.

The membranes of the brain were protected by a thin strip of metal introduced beneath the skull through trephine openings. Prior to the operation the scalp was shaved, and hemorrhage was obviated by a bandage encircling the head horizontally three or four times, and a strip of rubber adhesive plaster drawn tightly over it. In spite of the supposed inefficiency of this method, as expressed in the books, there had been practically no loss of blood except that retained in the flap by the bandage. If, in the temporal fossa, there is a depression, simply insert a pad at that point. The scalp having been turned back, the trephine openings were made, the latter were joined by two courses with the saw removing a strip about half an inch broad and perhaps five inches long. To avoid making the incision, which was parallel with the long sinus, so long as to encroach on the frontal bone, he lengthened it by carrying its extremities down a distance over the side of the head. The edges were afterward made quite smooth with the bone-scoop. The scalp was then united and the bandage removed, and a dressing applied, which was left on a week or ten days. Shock from the operation with the trephine and electric saw seemed absent, and the patients had done as well, apparently, as if they had only been under ether. They left the bed on the fifth or sixth day.

LARYNGECTOMY. Dr. Henry L. Swain reported at the meeting of the American Laryngological Association a case of laryngectomy performed on a German, aged forty-two, who had an epithelioma which had followed on a simple fibroma of the right vocal cord, the latter having been known to have existed for a year previous. The epithelioma waxed great and filled the entire larynx, so much so that tracheotomy was done under co-

caine March 5th, 1894. March 18th the larynx was removed by Dr. W. H. Carmalt.

Incision was made from the hyoid bone to the sternum. A low tracheal opening was made and a sponge Trendeleuburg canula introduced, cross incision made at top of wound to sternocleidomastoid muscles on either side. The larynx was then laid bare, and bleeding being checked, a strong bistoury was iusertcd back of the larynx, between it and the esophagus. The trachea being liberated by a cut from the bistoury, the larynx was hooked up and dissection began from below upward. The anterior wall of the esophagus was carefully preserved until the arytenoid cartilages were reached. A cross cut was then begun, preserving a part of the mucous membrane of the arytenoids and the ary-epiglottic folds. The epiglottis was then cut across, the larynx freed, removed aud all bleeding checked. The epiglottis was then sewed on to the anterior wall of the esophagus, thus closing in the pharyugeal cavity and cutting off all communication from the wound in the neck. Subsequeutly the wound in the ueck was sewed up tight, except enough of the lower part of the median incision to allow of takiug in the upper riugs of the trachea, which latter were sewed into connection with the skin-flap, making a circular opeuing, turned upward and forward. The subsequent healing of the wound followed, without adveuture, save a large stitch-abscess above and back of the trachea, which healed iu a few days. The interual wound at the base of the epiglottis was observed to heal by first iuteution aud the patient could swallow water from the first and could take fluid nourishment at the end of a week, and regular hospital diet at the end of a second week.

The operation was done with the deliberate idea of doiug away with the opeuiug into the mouth, hoping that the patieut would be able to acquire a voice, as had beeu the case in a mau whose larynx had been extirpated in Philadelphia by Dr. Solis-Cohen, where all communicatiou betweeu the mouth and the lungs had been closed off.

The patient could make no audible sounds at first; later, sibilant consonauts were to be perceived, and later brief seutences and single words could be distinctly uuderstood with the back

turned so as to eliminate lip-reading. There was, for a time, nothing more than a whisper to the voice, but it afterward gained in strength.

At the date of writing the patient is suffering from a recurrence in the scar, where the tumor has attained great dimensions, and creates such dysphagia that a gastric fistula will be necessary to relieve the sufferings of the patient.

STATISTICS. Dr. Charles A. Powers and Dr. George R. White have collected the records of three hundred and nine, total and partial, laryngectomies, with a mortality from shock, hemorrhage, pneumonia, septic infection, or exhaustion, of thirty-two per cent. As most of these operations are done for malignant neoplasm, it will be interesting to compare the results with those of similar growths in the breast. One hundred and eighty total laryngectomies had been done three years, or more, before the report, with a mortality of forty per cent., and with six per cent. of cures: seventy-seven partial laryngectomies, with a mortality of thirty-three per cent. and with nine and one tenth per cent. cures.

It is obviously improper to include in the same category a case in which the cancerous process has progressed to the tissues outside the larynx and one in which there is a small endolaryngeal epithelioma. Keans found that when the growth was confined to the larynx thirteen per cent. of the total operations and twenty per cent. of the partial were free from recurrence *two* or more years after removal.

## V. ABDOMINAL AND VISCERAL SURGERY.

### GASTRIC SURGERY.

GASTRO-PLICATION. An operation for simple gastric dilation is reported by Dr. Joseph Brand, under the title of "Gastroplication." It seems to be an operation practically identical with that suggested by Bircher, in 1891, and practiced since by Weir and others. The operation, which consists in suturing through muscularis and serosa with Lembert sutures, a fold of the gastric wall which is turned into the lumen of the stomach pushing the mucosa before it, is suggested as a substitute for

the more formidable partial gastrectomy. In the case in hand over two hundred silk and catgut sutures were used in making two large tucks, one in the anterior and the other in the posterior wall of the stomach. The patient made a good recovery from the operation and was largely relieved from the distress attending an enormously dilated stomach.

GASTRIC ULCER.

Küster, who not long ago, recorded a case of ulcer of the stomach, in which surgical interference was followed by recovery, has reported a second case of gastric ulcer successfully treated by incision of the stomach, thermic cauterization and gastro-enterostomy.

In the treatment of perforating ulcer by laparotomy and suture, Dr. A. V. Atherton, of Toronto, Canada, reports a successful case where the perforation was situated near the gastro-hepatic omentum, not far from the pylorus.

A case reported by Frederick Kammerer, of New York, where a perforation the size of a pea in the anterior wall, was sutured, while a much larger perforation on the posterior surface was not found till the autopsy suggests the possible propriety of a free exploratory gastric incision in such cases, in view of the possibility of the existence of multiple ulcerations, if not of multiple perforations. Such an incision would admit of the easy resection of the area surrounding the perforation before suturing, and ought not to materially increase either the length or the danger of the operation.

INTESTINAL SURGERY.

ENTERORRHAPHY.

A successful operation for gunshot wound of the intestine, with five perforations of the intestine, was performed by Dr. William H. Carmalt, of New Haven. Czerny-Lembert sutures were used without resections of the gut.

APPENDICITIS.

Dr. John L. Heffron and Dr. Nathan Jacobson, of Syracuse, N. Y., have rendered a report on four cases of appendicitis, especially interesting from the fact that Dr. Heffron discusses the medical, and Dr. Jacobson the surgical aspect of the same cases.

The surgical conclusions arrived at are that the evidence of continued progression at the end of twenty-four to thirty-six hours justifies, and indeed, calls for operation.

Operations are described as early and late. An early opera-

tion implies its performance during the period in which the inflammation is still limited to the appendix. The element of time is not the only consideration in determining whether or not the operation be early. If during the first twenty-four hours of an appendicular inflammation, the infection has spread through the lymph vessels of an unperforated organ, or has extended from one disorganized, and involved the whole peritoneal cavity, it is evident that the operation then performed is early in point of time, but too late to avoid widespread and probably fatal septic inflammation. On the other hand, an operation performed on the third day, as in one of the cases reported, while not done upon as early a day, was still timely, for by it septic peritonitis was undoubtedly averted.

Late operations are those performed after abscess formation has occurred, walled off by firm adhesions. The mere incision of these abscesses is a comparatively simple operation. But during the period of their formation it is often a matter of great difficulty to determine whether the patient's chances may not be improved by delaying operation until nature has rendered her fullest assistance. There is a group of cases seen from the third to the fifth day of sickness, when we may hesitate whether we may not be too late for an early operation and too early for a late one. Done at this period, no operation in surgery is more difficult than the removal of the appendix without infecting the general peritoneal cavity. To perform a radical operation the rule must be to operate early. In the late operation in cases of large periappendicital abscesses, we must avoid digging up the appendix, which can only result in breaking down nature's protecting wall of adhesions, and in thus infecting the general peritoneal cavity.

PECULIAR APPENDICEAL ABSCESSES.

Dr. Paul T. Mundé contributes to our knowledge of perityphlitis two cases of appendiceal abscesses in the female, simulating intraperitoneal or true pelvic abscess. The first of these was that of a girl with a more or less constant offensive discharge from the vagina. Examination showed the hymeneal opening dilated by a soft fluctuating tumor, pressure upon which caused a discharge of offensive pus. A small opening was discovered on the right side of the vagina, from which the pus oozed on pressure. A sound passed into the

cavity reached as high as the crest of the ilium. A second case showed the vaginal canal almost completely closed by a doughy swelling between rectum and vagina. Vaginal examination being difficult, the finger was inserted into the rectum and at once found a soft fluctuating spot in the recto-vaginal septum, which was ruptured by the examining finger, liberating at least a quart of foul pus. The finger then entered a large cavity, through which the sexual organs could be palpated and felt to be entirely normal. Both patients recovered.

PERFORATING TYPHOID ULCER.

Dr. Robert Abbe, of New York, records a successful case of operation for perforating typhoid ulcer. Two pints of foul, purulent fluid and thick lymph were removed from the abdomen, which was then irrigated with one to twenty thousand bichloride, and later with warm water. A gangrenous perforation in a Peyer's patch was closed by interrupted silk sutures, over which two layers of Halsted mattress stitches were placed. The gut was then dropped back into the belly. A large abdominal tamponade of iodoform gauze was placed within the abdomen and pelvis and no attempt made to close the wound. Dr. Abbe quotes from an article by Fitz, (1891). The similarity of typhoid perforations of the bowel and those of the appendix is striking. Cases of perforating appendicitis have repeatedly been regarded as typhoid, and as a rule the symptoms of typhoid, which suggest perforation of the bowels, are those which in the absence of typhoid would be regarded as diagnostic of appendicitis. The symptoms are not merely similar, they are actually identical, even to the usual localization of the consequent peritonitis in the right iliac fossa. Correct statistics, revised up to date, stand seventeen cases, with three recoveries.

RESECTION OF THE RECTUM.

Six cases of osteoplastic resection of the sacrum by the method of Rydygier, are reported by Dr. Frederick Kammerer, who commends the operation for its simplicity and ease of execution, as well as for its complete exposure of the rectum, enabling him to resect in one case of rectal cancer about five inches of the gut with primary union throughout the whole area, which had been sutured, and complete cicatrization of the remaining parts in six weeks. The external appearance of the parts afterwards was normal, with

the exception of the lines of cicatrix. He operates in the knee-elbow posture.

CHOLECYSTOTOMY. Dr. Thomas H. Russell, of New Haven, performed a cholecystotomy for gall-stone, removing five gall-stones from a gall-bladder, enormously hypertrophied through repeated efforts at expulsion. The walls of the gall-bladder measured at least three-eighths of an inch in thickness and the whole organ had much the appearauce of the uterus of a girl at puberty. When incised the gall-bladder contained little or no fluid, but was closely contracted down upon the five calculi of moderate size, which had not been able to engage in the duct, which was found patulous.

SPLENECTOMY. In reporting a successful splenectomy for malarial enlargement, with pressure symptoms, adhesions, displacement and twisting of the pedicle, Dr. W. J. Conklin, of Dayton, Ohio, epitomizes the present position of splenectomy as follows:

It is unjustifiable in leucocythemia or other conditions in which there is extensive involvement of the lymphatic glands or a notable iucrease in the white blood-corpuscles. It is indicated in tumors, simple hypertrophies, and other splenic enlargements which have proven rebellious to simpler methods and are attended with danger or serious disability. In movable or displaced spleens, requiring interference, extirpation is preferable to operative fixation. Severe traumatisms of the spleen, with or without an external wound, or simple prolapse of the gland into a parietal wound, demand, as a rule, immediate extirpation. In cases of protrusion, experience shows that excision, partial or total, is a safer procedure than mere replacement. Removal of the spleen for cystic disease has an excellent record, but most authors advise a preliminary trial of incision with drainage. In abscess it is better, except in rare cases, to incise and drain than to attempt removal of the organ.

### SURGERY OF THE PERITONEUM.

TUBERCULAR PERITONITIS. One of the curiosities of surgical therapeutics is the treatment of tubercular peritonitis by insufflations of air, as practiced by H. Folet, (Révue de Chirurgie) After removing serous fluid with an aspirator, the peritoneum is blown up like a bag, three or four litres of air being thrown in. The results are said to be good.

SEPTIC PERITONITIS.

Dr. Charles McBurney, in reporting twenty-four operations for septic peritonitis, following appendicitis, tells of his method of cleansing and draining the abdominal cavity. After a large incision, four or five inches, all pus apparent at the point of incision was wiped away with dry sponges. A small sponge, on a holder, was thrust in among the mass of intestines wherever it seemed possible that pus could lie, and examined to see if it were wet with fluid on withdrawal. When all purulent or seropurulent products have been as thoroughly sponged away as possible, the washing process is begun, sterile salt solution of the uniform streugth of six-tenths of one per ceut. being used as hot as can be comfortably borne by the hand of the operator.

In the cases reported only one method of performing the washing has been employed. The solution has been poured from a pitcher or glass-flask, so as to first fill the pelvis. This has been sponged out rapidly and then a fresh supply poured in, and so on until the fluid returned perfectly clear. At the same time I have used an ordinary operating sponge, on a long handle, very much after the manner in which the piston of a pump works, rapidly and vigorously pumping up and down, from the bottom of the pelvis to the wouud. When the solution returns perfectly clear, the same washing has been made in the right loiu, and then in any direction where septic fluid has been detected. Finally, the pelvis has been sponged as dry as possible and a long glass drainage-tube, with lateral openings, passed to its very bottom, a piece of gauze for drainage passing through the tube from one end to the other. A single strip of iodoform gauze has usually been passed close beside the tube, and also to the bottom of the pelvis. If the loin has been suspected aud washed, iodoform gauze is passed upward outside of the colon as far as the kidneys. If the general cavity toward the median line or beyond has been involved, the packing is introduced in strips from three to six inches beyond the wound in various directions among the intestines. Finally, the large wound surrounding the stump of the appendix has been widely packed with gauze—no suturing of any kind being attempted—over all a large mass of dry sterilized gauze and cotton is bound with a firm, broad binder.

# THE LOCALIZATION OF INTESTINAL OBSTRUCTION. ILLUSTRATED BY THREE CASES.

W. S. MACLAREN, M.D., LITCHFIELD.

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*Mr. President and Gentlemen:*

The three cases which I have selected for my paper to-day have been chosen as illustrating most beautifully what I consider a cardinal point in the localization of intestinal obstruction.

It is, that the *severity* of the symptoms caused by an obstruction will *decrease* as the distance of the lesion from the stomach *increases.*

This is a point which I do not think can be brought out too emphatically.

The symptoms caused directly by an obstruction to the intestine are four in number: pain, generally localized and remittent; vomiting; borborygmus: and constipation or obstipation.

If the pain is very severe or the vomiting is constant, we get the rapid pulse of exhaustion.

If there is strangulation of the intestine the strangulated portion becomes at once a foreign body, and we get a certain amount of peritonitis from its presence.

In the early stage of the necrosis, caused by the strangulation, we get some septic absorption; and later we see the shock and collapse due to perforation. But all of these symptoms are merely concomitant, and are not symptoms of obstruction.

I believe this to be a very important distinction.

For if we regard these concomitant symptoms as true symptoms of obstruction, we will be misled in our diagnosis in that most important class of cases, the uncomplicated ones.

Or we will wait for these symptoms to develop, i. e., we will wait for the development of complications which will largely diminish the chances of cure by operation.

Therefore, I say if we would make a diagnosis in time to have it of any value to our patient, we must not attach any importance to the *severity* of the symptoms.

But, having once diagnosed obstruction, then the severity of the symptoms should have the greatest weight in helping us to locate the lesion.

To put it briefly, the diagnosis should hinge altogether on the *character* of the symptoms; the localization largely on their *severity*.

To illustrate what I mean, take one of the most marked and constant symptoms, the vomiting.

If the obstruction is high in the small intestine, this will be early, persistent and severe; if low in the small intestine, it may be early, but will not be persistent, nor as a rule, severe, for at least twenty-four or forty-eight hours; while if it is low in the large intestine, there may be no vomiting at all.

My explanation of this fact is very simple.

The slight and occasional attacks of vomiting are reflex and due to the irritation from the obstructing cause, and with them nausea is apt to be not very marked.

The severe and persistent vomiting does not occur until the intestinal contents have been forced back into the stomach, and then the nausea is great.

When the obstruction is high in the small intestine, the proximal portion of the intestine becomes over-distended in a very few minutes and the first few spasmodic contractions of the intestine are sufficient to force the contents back into the stomach.

If the obstruction is near the ileocœcal valve, there are twenty feet of small intestine, which are more or less empty at first and must be filled before the peristaltic action can cause any regurgitation.

When the obstruction is in the large intestine we have a new factor, which exerts a marked influence over our symptoms, the ileocœcal valve.

If this valve is competent, particularly if the muscular layer of the large intestine is not very active, it will be days, instead of hours, before the vomiting becomes characteristic.

With each contraction of the small intestine enough fluid will be forced through the valve to relieve the tension, and regurgitation does not occur.

If the walls of the large intestine are strong there will finally come a time when the tension within is so great that the small

intestine is powerless to force anything further through the valve; it distends rapidly and regurgitation into the stomach takes place.

If, on the other hand, the walls of the large intestine are atonic, it distends passively, before the powerful contractions of the small intestine, and in such a case I have actually seen rupture of the large intestine occur without any previous vomiting, marked pain, or, in fact, any symptoms other than progressive, abdominal distention and complete obstipation of eleven day's standing in a woman whose bowels had previously been perfectly regular.

In regard to pain; this, like the pain of labor, is caused by the effort of a muscular organ to empty itself of its contents against a resistance and varies with the force of the contractions and amount of resistance to be overcome.

For this reason we do not notice any very great difference in the pain, whether the obstruction is high or low, in the small intestine.

The small intestine is strong and active and hence obstructions less usually cause intense pain.

In the large intestine the peristaltic contractions are not so strong as they are in the small intestine, and for this reason pain is not so marked a feature.

But if pain and vomiting are not so marked in this region, we have one other symptom which is constant, and that is *obstipation.*

Obstipation, particularly if the bowels have been previously regular, should always make us suspect and look for a possible obstruction.

If, on digital examination, the rectum is found to be *empty*, obstruction should be considered probable. And if high injections at first bring merely small particles, and finally nothing, and if these are followed by high, turpentine or glycerine enemata, and still we get nothing, obstruction is certain.

If the obstruction is caused by a fecal impaction, it can generally be exactly located by palpation and percussion.

If by some form of constriction, we can generally map out the colon by these same agencies down to a certain point, at which it becomes lost, and if this point lies near the sigmoid,

the portion of the bowel below the obstruction can be distended by high injections, so that going upwards we can get a dull percussion note up to the point at which the tympanitic note was lost, and the obstruction will be definitely located.

To illustrate the different pictures we get from obstruction in the three locations, let me briefly give you the histories of three cases.

Case I. On February 1st, 1895, I was called to see Mrs. H. F——, aged twenty-five years. At the time her condition was as follows:

She was suffering intense, constant pain, with frequent marked exacerbations, and referred to a median point midway between the ensiform and the umbilicus. Each examination of the pain was accompanied by loud borborygmus and followed by vomiting. At first the vomited matter was merely the stomach contents, later it consisted largely of bile. The bowels had been quite regular and moved freely, twice on the day before this attack.

Temperature and pulse normal. Examination of abdomen revealed nothing.

This train of symptoms, together with a history of a probable peritonitis ten years ago, ever since which there have been occasional attacks of pain in this same region. Made the diagnosis of intestinal obstruction quite plain.

The fact that the vomiting was so marked from the outset and so soon became intestinal in character, made the high location probable. Large doses of morphine were given hypodermically to relieve the pain and quiet the exaggerated peristalsis, and glycerine enemata ordered to remove whatever might be in the bowel.

February 2nd. There had been no result from the enemata and the pain, borborygmi and vomiting still continued.

As the pulse, though still of good quality, was ninety-five and the patient was beginning to feel the exhaustion due to the prolonged pain and vomiting, an immediate operation was urged, as being far less dangerous than any further delay, and with the assistance of Drs. J. L. Bull and J. T. Sedgwick it was performed a few hours later.

The abdomen was rendered aseptic, and as the patient was suffering from a painful ovarian and tubal disease, which it was

hoped to relieve at the same operation, a small median incision was made midway between the umbilicus and the pelvis.

The collapsed intestine was soon reached and on being traced up was found adherent high in the abdominal cavity. The incision was prolonged two inches above the umbilicus, and the point of obstruction was reached at once.

The obstructing cause was a dense fibrous band, passing from the mesentery over the intestine and adhering to a neighboring coil of intestine.

This band was divided between ligatures and a portion of it removed.

The rest of the intestine was searched and six similar bands were found crossing it at various points; though none of these was tight enough to cause any obstruction, all were removed, and their stumps ligated.

In the same region there were a few ordinary peritoneal adhesions. These were broken up with the finger.

The right ovary was decidedly enlarged, cystic and bound down by adhesions.

The tube was very much strictured and constricted.

The left appendages were normal. The diseased tube and ovary were removed, after freeing adhesions.

As the stump was dropped back a severe hemorrhage occurred from the slipping of the pedicle ligature. This was secured as speedily as possible.

The abdomen was flushed and left filled with a hot saline solution. The wound was sutured with silk and the usual dressing applied. Time of the operation, two hours. Though the patient lost so much blood that her pulse was one hundred and sixty at the close of the operation, was between one hundred and forty and one hundred and fifty for two days and on the third day only got down to one hundred and twenty, she has since made a very good recovery.

Case II. On August 18th, 1894, I was called to Northfield, Ct., to see Mrs. E. T——, in consultation, the diagnosis of acute intestinal obstruction having already been made by the attendant, Dr. Smith, of Thomaston.

I found a patient sixty-six years of age, who gave the following history:

Appendicitis (?) one year ago. Various uterine disorders for several years, otherwise previous history good. Present illness began seven days prior to my visit.

At that time she went out in apparently good health to take supper with friends.

On returning home was suddenly taken with severe abdominal pain, not definitely located.

She vomited once during the night. Nausea was not marked.

During the next day the bowels moved, the pain continued, and there was occasional vomiting. On the second day the bowels ceased to move, and after that it was not possible to secure a movement by the use of enemata. The physician very properly refrained from the use of any cathartics.

Very little nourishment had been taken during the week.

The pain had been constant, and at times quite severe.

Vomiting had steadily become more severe and for the last sixteen hours was occurring every few minutes, was stercoracious in character and attended by great nausea.

The patient appeared well nourished.

The face rather anxious and drawn. Abdomen moderately and evenly distended and tympanitic.

Nothing could be determined by palpation.

Temperature normal. Pulse ninety-five and of good quality.

The diagnosis of intestinal obstruction was concurred in by me, the location was decided to be probably the lower part of the small, or upper part of the large intestine.

As Dr. Smith kindly consented to administer the ether, I decided to operate at once without waiting for further assistance.

Operation. After the usual routine of cleansing and disinfecting the abdominal wall, a four inch incision was made three-quarters of an inch to the right of and parallel with the median line. On opening the peritoneal cavity it was found to contain quite a large quantity of bloody serum. The transverse colon was immediately searched for and drawn down into view. It was found to be collapsed. It was traced upward, the caput was passed, and at a point about two feet above the caput the small intestine became distended, and from this point upward it was markedly distended, of a deep purplish color.

At the point of transition from collapse to distention there were no adhesions, nor was there any apparent change in structure.

On handling it, however, it was found to contain a hard mass. This mass was so tightly wedged that it could not be moved either up or down.

A one inch incision was made in the intestine and an enterolith weighing, when fresh, three hundred and four grains, was extuded. The intestinal wound was closed by one row of Lembert sutures. As shock was beginning to be quite manifest, the abdominal cavity was flushed and left filled with hot saline solution.

The wound closed in the usual manner.

Owing to the lack of assistance and the great difficulty experienced in returning the distended intestine to the abdominal cavity and keeping it protected, the operation, which should not have taken more than three-quarters of an hour, required double that time.

And to this length of time and the exposure of the intestine, I think we may attribute the state of shock from which the patient never rallied, and in which she died at the end of twelve hours.

Case III. April 13th, 1894, I was called to see Mr. C. L——, farmer, native born, aged forty-five. Previous history very good, though ever since boyhood he has been liable to attacks of colic following any slight indigestion. They have never been severe, have only lasted a few hours, have always been relieved by pressure and never have been accompanied by any distention, by vomiting, nor by constipation. Six weeks before my first visit he had an attack, with which there was slight vomiting.

A mild cathartic took speedy effect and relieved all the symptoms.

Four weeks later there was a similar attack, which persisted up to the time of my visit.

During this past two weeks pain had been pretty constant, though tho patient was able to keep about and do light work.

He had taken cathartics quite freely and secured a small movement each day.

For the past three days there had been no movement, pain

had been more marked, and accompanied by loud borborgymus and there had been occasional attacks of vomiting.

Patient rather poorly nourished. Temperature ninety-eight and eight-tenths. Pulse eighty-four.

Abdomen not distended, percussion tympanitic, except over sigmoid, where there was dullness.

Peristalsis not constant, but exaggerated and accompanied by pain and gurgling.

Rectum found to be empty on digital examination.

As small particles of fecal matter were brought away by high enemata, this line of treatment was persisted in and was soon rewarded by a discharge of flatus.

For ten days this treatment was continued, two enemata being given daily, and mild cathartics were used, as flatus passed freely.

As there was no further improvement, an operation was advised, but owing to the comfortable condition of the patient it was refused.

On May 6th the obstruction became complete. It was not possible to bring away any fecal matter with the enemata and flatus ceased to be passed.

Abdomen slightly distended.

May 7th abdomen much more distended and quite painful.

The colon could be readily palpated to a point just above the left iliac fossa, then it appeared to end by a rounded extremity.

On distending the rectum by the injection of water, a fluid tumor was created, which could be readily traced by percussion as high as the rounded end of the tympanitic colon.

The great need of operation and the extreme danger attending delay, was again urged, and the patient's consent finally obtained.

With the assistance of Drs. J. L. Bull and J. T. Sedgwick, I operated in the usual manner, through a median incision.

As the lesion could be located so exactly, there was no exposure of the intestines.

I was able to introduce my fingers and immediately draw the stricture into view.

It was found to consist of a dense fibrous construction about an eighth of an inch in width. The bowel above and below the

constriction appeared normal externally, but evidently contained a neoplasm.

There were two small hard nodules in the neighboring mesocolon. The lesion was situated in the upper part of the sigmoid, at its junction with the colon. Owing to the short mesocolon, it was difficult to draw the affected portion outside of the abdominal cavity, but by depressing the abdominal wall it was possible to make about two inches of healthy intestine, below the lesion, available for work.

The appearance of the lesion was so suggestive of malignancy that I decided to resect.

This I did, removing about three inches of the colon and sigmoid together, and doing an ordinary end to end colon-sigmoidostomy. The nodules in the mesocolon were removed at the same time.

The loop of intestine was irrigated and dropped back.

The abdomen was not flushed as it had been fully protected by gauze-pads, and there was no shock.

The only point in the after treatment worthy of note was the introduction of a soft rubber rectal-tube, which was inserted its full length. This was kept in constantly for three days, carrying off large quantities of liquid feces and a great deal of gas.

At the end of the third day the rectal-tube was removed and there were several large spontaneous discharges of semi-solid fecal matter.

The patient made an uninterrupted recovery, and two months later was working in the hay-field.

As the neoplasm proved to be adeno-carcinoma, the probability of ultimate recurrence was, of course, very great.

After nearly a year of very good health, he began to develop symptoms of a new growth in the liver. These symptoms progressed very rapidly and the patient died just one year after his operation.

Through the courtesy of Dr. Bull, I was able to be present at the autopsy, and secure the specimen, which I show you to-day.

The liver was completely filled with carcinomatous nodules.

There was a small recurrent growth in the intestinal scar, not large enough to cause any symptoms.

The other organs were perfectly normal.

These three histories are such perfect types of obstruction in the three locations that it is hardly necessary to emphasize the important features.

Obstruction high in the small intestine causes intense pain, each spasm of pain being accompanied by borborygmus, vomiting is severe and persistent from the start, and almost immediately shows intestinal contents.

Obstipation may be late in appearing. When the obstruction is low in the small intestine, the pain and borborygmus are the same. Vomiting at first is apt not to be so constant and is merely the stomach contents; later it is more constant and is intestinal in character.

Obstipation is apt to appear earlier.

Obstruction low in the large intestine gives quite a different picture.

Vomiting is apt to be slight, and may be absent altogether. Pain is not quite so severe, and is apt to be decidedly intermittent in character, and may be absent till shortly before the end.

Borborygmus, pronounced or slight, according to the presence or absence of severe pain.

Obstipation is apt to be the first symptom, and sometimes the only one.

In obstruction of the small intestine the progress of symptoms is generally so rapid and operation so soon becomes out of the question, that there may be some excuse for neglecting it.

But in the case of the large intestine the symptoms progress so slowly and the diagnosis is so readily made that a patient with obstruction in this region never ought to die without being offered relief by operation.

For this reason I believe that too great stress cannot be laid upon the urgent necessity for early diagnosis in these cases of low obstruction in the large intestine.

For alarming symptoms are almost certain to be followed very quickly by collapse and death. Hence, if the diagnosis is to lead to operation, it must be made early; if made late it will merely serve as an interesting preface to the autopsy.

It is a significant fact that as we approach the lower end of the bowel, that is as the severity of the symptoms decreases, the frequency of operation also decreases.

This is very clearly shown by such tables as that published by Dr. J. B. Murphy, in the Medical Record of May 26th, 1894, in which he has collected one hundred and thirty-eight entero-enterostomies.

Of these only thirteen are operations wholly upon the large intestine, and only four involved the sigmoid, a point at which obstructing disease is relatively common.

As an evidence of what becomes of the cases that are not operated upon, and hence not published, let me say that during my service as a hospital intern, three cases of obstruction of the large intestine were admitted, one being of the transverse colon and two of the sigmoid. All of them were in good condition. None of them vomited and none of them having severe pain.

Alarming symptoms developed in all of them so short a time before the final collapse, that all of them died before the condition was relieved.

No other class of obstructions gives us an easier diagnosis, more time to prepare for the operation or greater hope of a successful issue, and yet no class is allowed to die more often unrelieved.

And simply, I believe, because we allow ourselves to be misled by the absence of alarming symptoms.

## OBSERVATIONS ON OPERATIONS FOR RADICAL CURE OF HERNIA, WITH REPORT OF CASES.

GEORGE C. JARVIS, M.D., HARTFORD.

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When one realizes what the genuine relief and permanent cure means for those who have been victims to this misfortune, he can readily accord this as one of the many very important successes of modern surgery. Without attempting any history of the measures for the permanent cure of this physical misfortune, I think we may give to Dr. Charles McBurney, of New York City, the credit of being the beginner of one of the important steps in this direction. The idea of dissecting out with care and delicacy the hernial sac or infundibular form fascia is this important step toward the success which others have obtained by adding other ideas to it. The dense cicatricial wall from which he, McBurney, expected so much as a support to the contents to be retained behind it proved valuless, consequently after this had failed other means were naturally sought for by those watching his results. The Halstead, or Bassini, method seems now to have filled the requirements in that place. Following the steps of this operation, when the sac has been carefully dissected up to the internal ring, after this it is carefully incised or cut off and the edges sewed together with very fine silk, is then placed in the abdomen, then the cord is carefully dissected to the interual abdominal ring and is raised on a blunt hook. Behind this the other muscles and facia are stitched firmly with his so called "mattress stitch." The material used for the suture is the finest iron dyed black silk, and which in his cases has answered a most perfect purpose, as out of a large number of cases he has never had a stitch abscess. While absorption is not as rapid as with catgut or kangaroo tendon, it keeps the tisues in place without any apparent trouble, as the cases examined after the dressings have been on a week, show no signs of redness, heating or inflammation. The next step, and an important one, in his wonderful success is the way he avoids suturing the epidermal layer of the

skin by what a seamstress would call blind stitching. I have found this stitch, in my own hands, to make practically no stitch abscesses.

Describing this, the Bassini method, Halstead in his first report of cases published in the Annals of Surgery says himself that his operation and Bassini's are materially the same. Since this operation has proved so successful other surgeons have published reports and seemed to be trying to improve on what has already been so near perfect in its success. I have myself seen five different modifications practiced by five different surgeons reported within the past year. What value there can be in these I may not be able myself to appreciate and thiuk all but one hardly worth while to refer to. But one modification, practiced by Dr. Coley, of the Hospital for Ruptured aud Cripples, in two hundred cases reported upon, I will call your attention to for a short time. Iu the first place after Dr. Coley dissects his sac out as previously described in Halstead's cases, he ligates the sac as close to the iuternal ring as possible with a strong silk ligature. After this is ligated he cuts off outside of this ligature the sac as close to the ligature as he considers it safe, leaving it in this condition as Halsted leaves his after it is carefully stitched. Now what advantage there can be in the strangulatiug of this sac over the stitches used by the Halsted method I am unable myself to conprehend. If this sac is cut too close the ligature in time is liable to slip leaving a free opening. If not cut quite short cnough the remaiuing portion of the sac outside of the ligature is not exempt from liability to slough, causing a direct commuuicatiou with the most important part of the opening and where a new process of bulging can easily begin again. If a third process happens, a small stitch sinus remains so connecting with this part of the closure and thus impairing the strength of the most inportaut part of the operation. Dr. Coley uses kangaroo teudon which may be better than fine silk in his hands, but it is not where I have seen it nsed.

In some cases where the sac is small and ouly a little promiuent, without having really formed into the tunuel shape, I have myself neither ligated the sac nor cnt it, but have sewed the dissected surfaces together with the free portions turned into the abdomen and find it exceedingly easy. When the sac forms

the infundibula or tunnel shape, cut off the outside and sew the edges together, dropping it into the abdomen through the internal ring. I have done just exactly what I have seen Dr. Halstead do, and have thus far seen no reason to follow any other plan.

There have been reported so many ordinary mild and moderate cases without either a death or return of the trouble, that I need not add to the number, although I could give a good many from my own list; but as I have had the fortune to come in contact with a few cases which were very unpromising before the operation, and which were exceptionally successful, these I will take the liberty to call to your attention, and will indicate wherein they were so unpromising.

So much has been accomplished during the last four years by the operative measures for the permanent or radical cure of hernia, and so little appreciation of the valuable results seem apparent, that I am led to call your attention to a few selected cases of operation for the permanent or radical cure of hernia. These cases will illustrate some of the difficulties frequently encountered in making an accurate diagnosis until the opportunities for examination during the progress of the operation. The operations as performed by Bassini of Padua, and William S. Halstead of Johns Hopkin's Hospital, are in the main alike in their intentions. The object to be attained for success is a strong muscle and fascia wall firmly united by rapid primary union. Each operator has his own method of accomplishing this purpose. Bassini changes the location of the cord by a careful dissection, and uniting the muscles and fasciæ without impairing the integrity of the cord. Halstead's method, practically the same as the other, is different in this, that he diminishes the size of the cord by dividing the two spermatic veins, and secures the hernial sac by dividing it near the opening, turning the free end of the sac in, and uniting the dissected surfaces by what he terms the mattress stitch. The operation by different surgeons within the last four years has now been repeated several hundred times. The mortality as reported by a New York surgeon in a recent periodical, is about one per cent., which far exceeds my figures of the cases gathered, the reason for which is probably that his cases include those operated upon and treated by the McBurney method. This plan

has been abandoned by surgeons in general, there being no means of preventing accidents during the progress of operation from large and unpromising cases. The results of the operations by those methods now in use by the leading operators, and of those which have been in my own hands, also according to my observations of others, have been exceedingly satisfactory, but as to the cases which I am about to present I have seen no reports of any exactly similar, and, therefore, I take the liberty of presenting them.

The first is that of a laborer, forty-eight years, operated on in May, 1891. The hernial tumor was easily reducible, but after the reduction, by external examination, the impression was conveyed of a tumor of the spermatic cord about six inches in circumference. On testing the tumor for impulse produced by coughing or straining, no impulse could be felt. On cutting down to the cord and opening the abdomen the tumor proved to be a portion of an omentum, hardened, and attached by small bands of adhesion to the inner side of the sac, the small adhesions not being appreciable on examination by manipulation through the walls of the hernial sac. The omental tumor was removed, and sac sewed up, after the Halstead method, with buried stitches, and the final or skin sutures were also buried. The recovery was complete and rapid, the result being very satisfactory, as there has been no return of the hernial tumor; and as this patient's business was that of a laborer, heavy lifting. As yet it has at no time returned.

The second case occurred in the person of a gentleman in the mercantile business. The hernia was reducible, with the exception of a tumor which could be felt through the skin, lying in upper part of the canal. After dissecting to the hernial sac, the tumor was found to be a glandular one, part of the cord, and fastened with a fibrous band and attached to the hernial tumor, which prevented the complete return of the contents of the sac into the free surface of the abdomen. In all respects the operation was successful, and the recovery complete by perfect and rapid union per primam, and in three weeks he was able to resume business in full.

Laborer, aged about sixty-five, a resident of Hartford, Irish born, and a man of extraordinary health and fine physique, was

suffering from a hernia that could not be retained by any method or truss that could be devised. The operation was performed in 1891. The notable features in this case were the size of the hernia, which was about sixteen inches in circumference, and the contents of the sac. After making the opening to and through the hernial canal, the opening into the abdomen would readily admit the two double fists. The sac contained the colon, caecum, appendix, mesentery, omentum and small intestines. The lower, or posterior wall of the sac on the inside was adherent in the upper part to the mesentery and posterior portion of the caecum and appendicular portion of the colon. After careful dissection and separation of the adherent parts, and removal of the appendix, which was found in a mass of exudate which surrounded the intestines, omentum and mesentery elongated by stretching, the proper contents of the abdomen were returned and the closure of the abdominal wall was completed after the Bassini method, without diminishing the cord or cutting the spermatic veins. After sewing up the opening made by the stretched hernial contents, the length of the closed orifice of the hernia was ten inches. The union was perfect, the man resumed work in six weeks after the operation and has been able to follow his usual vocation ever since.

Miss A. E. G., aged seventeen, unmarried, American born, was suffering from the pain of a tumor in the right inguinal region, and the tumor was irreducible, but had been reducible up to the day previous to the operation. The operation was performed February 7th, 1894, in Hartford, assisted by Drs. Taft and Crary. After opening down to the sac, the appendix vermiformis and omentum, and a portion of the caecum and jejunum were found in the sac. Separating the omentum and incising off a large piece of omentum, the caecum also being separated from a large mass of exudate, the remaining contents of the sac were returned and the opening sewed up by the buried sutures, and the result was perfect; rapid union and complete recovery. The young lady has been, and is now, in the best of health.

A laborer, aged thirty-six. A tumor could be felt through a hernial covering, resembling by palpation the texture of two hardened testicles. No impulse could be discovered when the patient coughed or made severe straining in any other way.

The tumor was a hernia of the left side, and on opening, these two bunches, which before opening seemed to resemble so much hardened testicle, were found to be two hardened portions of the omentum, from opposite sides of the abdominal cavity. The one from the right side of the omentum was about as large as a fair-sized hen's egg, and the other one, somewhat smaller, was from the opposite side of the omentum, on the extreme left. They were taken out, dissected off, and the omentum returned, and the hernial opening closed up by Halstead's method. Recovery was complete and rapid, except two small stitch abscesses in upper part of wound, which did not impair complete recovery under care of my esteemed friend, Dr. Morrisey.

Miss C., suffering from an umbilical hernia, she being five feet two inches high, aged forty-two, and weighing two hundred and ten pounds, came under my care from Dr. Murless, in 1891. The peculiarity of her case was the size of the tumor, and the fact that the entire tissues beneath were adherent and could not be returned; perfectly irreducible. On opening the sac the intestines were all an adherent mass of omentum, stomach wall and mesentery, the parts only distinguishable from one another after the most careful dissection; a process which occupied an hour and twenty minutes rapid work. The Halstead method of skin and deep tissue stitching was used. Recovery rapid and complete and the patient is now a hard working woman.

# THE DIAGNOSIS AND NON-OPERATIVE TREATMENT OF APPENDICITIS WITH REPORT OF CASES.

JOHN F. DOWLING, M.D., THOMPSONVILLE.

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Inflammation of the vermiform appendix, or appendicitis, is a condition that has, and at the present time is, securing a large share of attention, not alone by the medical profession, but the laity as well. It has absorbed the minds of physicians and surgeons the world over, but especially in our own country. And we have reason to feel proud of the progress made and brilliant results obtained by American surgeons in this particular field.

The author of this paper does not wish to be understood as advocating a line of treatment that is entirely new and the application of which, will in all cases of appendicitis, prove infallible. I simply wish to draw attention to remedies that receive only a passing notice, or are entirely ignored in some of our modern text-books, in others mentioned only to be condemned. If the exact treatment advocated in this paper has been followed out, or suggested by others, I am ignorant of the fact. The question of treatment, as applied in appendicitis, is one that interests the general practitioner, as well as the abdominal surgeon. And it is the practitioner in our smaller towns and villages that should be most interested in the treatment of these cases, because he is obliged to rely largely on his own resources. He is not convenient to the consulting surgeon or specialist, and in an acute disease like appendicitis, which often proves rapidly fatal, in order to save his patient he must decide quickly, both in diagnosis and treatment. The fate of the patient attacked with appendicitis largely depends on the treatment pursued within the first forty-eight hours, and if non-operative treatment is to succeed, it must be applied vigorously during this time. There are three varieties of appendicitis, the catarrhal, suppurative, and gangrenous. This paper treats entirely with the first, except to say, that if after proper treatment the symptoms in-

crease in intensity and point to the suppurative or gangrenous stage, then the only rational method is to operate at once. Some eminent surgeons advocate operation in all cases. They insist that the catarrhal form may go on to the gangrenous or suppurative, and even should the patient recover without removal of the appendix, he is liable to subsequent attacks. All surgeons do not agree on this point, and we believe this radical opinion is with time and experience becoming modified. All must admit that if an operation is to be performed the patient has not only to combat the disease, but the shock of operation, and also danger of general septic peritonitis. Then it is our duty to apply those remedies short of an operation, which we believe will arrest the progress of the disease, and save our patient. He is the greatest physician or surgeon, who combats disease and saves his patient, by the simplest means. The diagnosis of appendicitis, as a rule, is not difficult. No doubt all are familiar with the leading symptoms, and you may think it superfluous that they are introduced in this paper. Nevertheless, I believe too much stress cannot be laid on the diagnosis of this disease. The attack generally begins suddenly, with severe pain of a colicky nature in the abdomen, radiating from the umbilicus. This is very often misleading and may be treated for colic (simple). At first there may be no tenderness, but generally within twelve hours after the first symptoms, the pain localizes in the right illiac fossa, with exquisite tenderness by deep steady pressure with the tip of the index finger at the so-called McBurney point, about two inches from the anterior superior spine of the illum, in a line with the umbilicus. This point of tenderness I have found in every case, although it may be absent late in the disease. There is an area of tenderness around this point about three inches in diameter, with rigidity of the muscles in nearly all cases. In all cases I have seen there was nausea or vomiting, and as a rule constipation, with exceptions to this. There is elevation of temperature, rapid pulse, and sometimes a chill. The patient in most cases favors the right side, with the right leg drawn up to relieve tension and pain. There are three points with regard to the symptoms I wish to emphasize. First, the pain at first simulates ordinary colic and seems to be most intense about the umbilicus, but within twelve hours

localizes in the right iliac fossa with exquisite tenderness at the point above described. Second, the difference in some cases between the temperature of the mouth and rectum. There may be a difference of three degrees. I have noticed this in two cases, described later on. Third, the bowels are not always constipated, they may be quite loose in some cases, but nausea or vomiting was always present. The non-operative treatment of appendicitis is somewhat limited, and that advised in our text-books, and by writers generally, is rest, opium, poultices, enemata, and salines. Of those mentioned, rest is the most important and, in my opinion, salines stand next. Opium should be used only to relieve excessive pain, because it masks the true symptoms of the disease. Poultices are an abomination if used with the intention of allaying inflammation; in most cases they hasten suppuration, and also the death of the patient. The ice-bag would be preferable to poultices, in this, as well as in nearly all cases of acute inflammation. The use of salines is condemned by Osler, and others, excepting in general peritonitis. Dr. Eliot, in a paper read before the Connecticut Medical Society last year, advocated the free use of salines in appendicitis. The method of treatment I have found productive of good results is by the application of leeches over the region of the appendix, and the free use of salines internally. If possible, this treatment should be commenced within twelve hours following the attack. I usually, in an adult, apply twelve leeches and after they drop off apply hot fomentations in the form of flaxseed poultices or cloths wrung out of hot water, to encourage bleeding for a few hours. The poultices are used simply to encourage bleeding and nothing more, at the same time giving teaspoonful doses of the sulphate of magnesia every hour until the bowels move freely. If they have not moved for two or three days I give an enema of soap-suds or olive-oil, and repeat in two hours, if necessary. The leeches, by abstracting a considerable quantity of blood, relieve the congestion around the inflamed appendix, and which is generally the case, the circumscribed peritonitis resulting therefrom. The sulphate of magnesia increases the intestinal secretions, and watery stools result. It lowers arterial tension, serum is withdrawn from the intestinal blood-vessels, and consequently an outpouring of fluid

into the intestinal canal. This outward osmosis from the vessels attracts the products of inflammation and they are swept out by the peristaltic action of the bowels. In a word, you attack the enemy front and rear, and if done early you will, I believe, in nearly all cases, come out the victor.

The following cases will illustrate the above mentioned treatment:

Case I. Charles G., aged eighteen years, born in N. S., occupation carpet worker. Was called to see him on October 22d, 1892, at 7 P. M. Found him suffering from severe pain, of a colicky nature, radiating from the umbilicus. His bowels had not moved for two days; he had also nausea and vomiting. Gave hypodermic injection of morphia gr. $\frac{1}{4}$, atropia $\frac{1}{120}$ gr.; this relieved him from the intense pain. Ordered an enema of warm soap suds to move the bowels. Called the next morning, October 23d, at 9 A. M. His mother stated that his bowels moved during the night. He was now doubled up in bed, the pain had shifted to the right iliac fossa, with marked tenderness, and by gentle, steady pressure with the tip of the index finger over the area described as McBurney's point, caused him to cry out with pain. His temperature was now one hundred and three, pulse one hundred and ten, nausea and vomiting continued. The abdomen was slightly tympanitic, but no tenderness excepting over an area of about three inches in diameter in the right iliac fossa. Diagnosis, appendicitis. I sent at once for leeches, but did not receive them until 4 P. M., or twenty hours after my first visit to the patient. Applied twelve leeches over the region of the appendix and ordered hot flaxseed poultices to be applied every hour after they dropped off. Also ordered sulphate of magnesia, in teaspoouful doses, every hour until the bowels moved freely. Called next morning, October 24th, patient was feeling better, his bowels had moved very freely through the night, still slight bleeding from the leech bites. The severe pain was gone, but some tenderness over the appendix remained, temperature one hundred, pulse ninety. Continued the sulphate of magnesia in one-half teaspoonful doses every three hours. Called during the evening, and temperature one hundred and two-tenths, pulse ninety-four; bowels moved several times since morning. Discontinued the sul-

phate of magnesia. Patient was now taking milk and lime-water for nourishment. Called next morning, October 25th; pulse and temperature normal, patient wanted to get up. He continued to improve, and was sitting up the eighth day, and returned to work a few days later. Three months later he had a second attack, with a duplicate of the symptoms of the first. The same treatment was instituted at once, and in about one week he was about, and has continued well since, one year and eight months.

CASE II. Garrett S., aged sixteen years, born W. S., school.

I was called to see him at 1 A. M., September 29th, 1893. His mother stated that he had been in his usual good health until the evening of the 28th, when he complained of severe pain in his abdomen. Some simple remedy was given, but at midnight the pain became so intense she sent for me. When I arrived he was crying out with pain, which seemed to be most intense about the umbilicus. I gave an hypodermic injection of morphine gr. $\frac{1}{6}$, atropia $\frac{1}{150}$, and ordered mustard poultice to the abdomen. I left at 2 A. M., when he was feeling easier. Called again at 7 A. M., or five hours later, and found him with a temperature of one hundred and one, pulse one hundred and twenty; the temperature by the rectum was one hundred and three and six-tenths, a difference of nearly three degrees. The bowels moved slightly at 5 A. M.; vomited several times. The pain was relieved for a short time by the injection of morphia, but had returned with even greater severity, and was now located in the right iliac fossa, with tenderness. This tenderness, by deep, steady pressure with the tip of the index finger was exquisite, causing the patient to protest against it very forcibly. Believing it to be a case of appendicitis, I ordered teaspoonful doses of the sulphate of magnesia every hour. There was some delay in procuring leeches and I did not receive them until 3 P. M. The patient was now in great agony, the pain and tenderness in the right iliac fossa had increased, the right leg was drawn up, temperature one hundred and three, pulse one hundred and thirty. Vomiting continued and the bowels had not moved since morning. If there was doubt in my mind of it being a case of appendicitis, it was now removed. I applied ten leeches and as the stomach was irritable, reduced the sulphate of mag-

nesia to one-half teaspoonful doses with mint water every hour, instructing his mother to apply poultices when the leeches dropped off. Called at 7 P. M., found the patient greatly improved, the pain was nearly all gone, the anxious countenance was replaced by one of comfort, the pulse had dropped to one hundred and four, temperature one hundred and one and two-tenths. The bowels moved three times since 3 P. M. Continued the sulphate of magnesia every two hours, also the poultices; ordered milk and seltzer water for nourishment. Called next morning, September 30, found him resting quietly, had slept considerable through the night, pulse ninety, temperature one hundred, no pain, slight tenderness, vomiting ceased. As the bowels were now very loose, discontinued the sulphate of magnesia, also the poultices; the bleeding from the leech bites had ceased. Continued milk, with light broths. Called in evening, pulse and temperature normal and continued so, patient was sitting up four days later; no recurrence.

CASE III. Mrs. B., aged forty, married, born in Ireland, mother of four children.

First saw her June 26, 1894, found her reclining on the sofa. She stated that two days before, while ascending the cellar stairs, she experienced severe pain in her stomach, did not pay much attention to it, but the pain increased and she was obliged to remain in the reclining posture. She remarked that she had the pain first in the stomach, but now was in the hip, as she expressed it. The pain was paroxysmal in character and very severe. The right leg was drawn up and the muscles in right iliac fossa somewhat rigid. By gentle manipulation I was able to localize the tender spot, about two and one-half inches from the anterior superior spinus process of the ilium, in a line with the umbilicus, with an area of tenderness about three inches in diameter. Temperature one hundred and two, pulse one hundred and twelve, with constipation and vomiting. Diagnosis, appendicitis. Ordered the patient to bed and dispatched her son to the drug-store for twelve leeches, and applied them before leaving. Prescribed teaspoonful doses of sulphate of magnesia every hour. She did not retain the first dose; then reduced the quantity one-half, with a few drops of essence of peppermint to overcome the nauseating effect of the saline. This worked well

and in four hours the bowels moved freely. As in the other cases, ordered poultices after the leeches had dropped off, which they did in about an hour. Called next morning, June 27. She was entirely free from pain, but some tenderness remained; temperature ninety-nine and three-tenths, pulse eighty-four. As above stated, the bowels moved several times during the night, vomiting ceased. Continued the magnesia once in three hours, discontinued the poultices. Called in the evening, temperature one hundred, pulse ninety, some tenderness over the appendix, no pain. The temperature and pulse for the next two days were slightly above the normal, when the tenderness disappeared, and she was about the house the tenth day.

Case IV. Gabriel D., grocery clerk, born in Canada, aged twenty-six. First saw him July 20, 1894, at 2 P. M. He was taken ill the previous evening with severe pain in the abdomen, but remained in the store until closing time. After arriving home he took cholera drops and brandy, but the relief was only temporary, the pain increasing in intensity. When I saw him the pain was in the right iliac fossa, with marked tenderness on pressure. He stated that about six months previous he had a similar attack, the pain commencing in the middle of the abdomen, or to use his own words, the belly, and after a few hours it shifted to where he now felt the pain and tenderness. At that time he did not call in a physician, but remained in bed a few days and then returned to work, although he experienced some pain and tenderness for several days after. His temperature I found to be one hundred and three and four-tenths, pulse one hundred and sixteen. His bowels had moved several times since the attack. He was vomiting and had a severe chill. There was no tenderness of the abdomen, excepting an area of about three inches in diameter around McBurney's point. The pain at times was agonizing, and increased by pressure. I made a diagnosis of recurring appendicitis, believing the first attack to be one of appendicitis, based on the statement of the patient, knowing him to be truthful and intelligent. On account of the chill and high temperature, I was fearful the second attack was of the gangrenous or suppurative form. I at once sent for leeches and applied eleven, prescribed teaspoonful doses of sulphate of magnesia every hour, until I returned.

Also instructed his wife to apply poultices every hour after the leeches dropped off. Called in the evening at 7 P. M., patient feeling better, less pain and tenderness, temperature one hundred and two, pulse one hundred. The bleeding from the leech-bites was quite free, continued the poultices. The bowels having moved several times, I reduced the sulphate of magnesia to one-half teaspoonful doses every three hours. For nourishment ordered milk and seltzer. Called next morning, July 21; temperature ninety-nine and four-tenths, pulse eighty-four. No pain, very little tenderness, vomiting had ceased. The poultices were discontinued, and as the bowels were very free, also the sulphate of magnesia. On the evening of the same day the temperature and pulse were normal and continued so. He returned to work five days later, and has remained well since.

In none of the above cases was the attack traced to a special cause, either traumatic or by an over indulgence in food. The etiological factors of appendicitis receiving the most notice are traumatism, foreign bodies, such as seeds, hard particles of undigested food, and fecal concretions. Also the bacilli coli communis may play an important part in setting up this acute inflammation. The question of diagnosis may be raised with regard to these cases. Admitting the question of fallibility, there are a few conditions that may be mistaken for appendicitis. Namely, fecal impaction of the ascending colon or cæcum, ovarian or tubal disease, peritonitis, cholera morbus, and ureteritis have been suggested as simulating appendicitis. In fecal accumulation there would not be the elevation of temperature and pulse we find in appendicitis, there would be a large sausage-shaped tumor, with little, if any, tenderness or pain. Ovarian or tubal disease may simulate appendicitis, but the onset is not so sudden and there is generally a history of uterine disease or trouble, antedating the attack. Also the pain and tenderness are lower down in the hypogastric region, excepting during pregnancy, when the uterus and appendages are higher up. In general peritonitis the pain and tenderness are more diffused over the abdomen, with board-like hardness. Ureteritis is said to have been mistaken for appendicitis, but I do not believe this will occur, or rarely indeed, having had two cases of ureteritis, one following the passage of a renal calculus, the

other in a woman after labor, probably due to pressure on the ureter during delivery, which was instrumental. The symptoms were irritability of the bladder, pain in the lumbar region, and sometimes shooting down the inguinal and hypogastric regions, but no tenderness on pressure, or vomiting. Cholera morbus should not, in any case, be mistaken for appendicitis. The elevation of temperature, if any, is very slight, the tenderness, which is due to vomiting, is found only in the epigastric region, and a hypodermic injection of morphia generally gives permanent relief in a brief space of time. The diagnosis of appendicitis, I believe, can be made within twenty-four hours following the attack, and the imperative demand on the physician is, if possible, to arrest the disease in the catarrhal stage and prevent it going on to the suppurative or gangrenous. This, I believe, can be accomplished most successfully by the application of leeches, and the sulphate of magnesia internally. If the patient fails to improve within twelve or fifteen hours, then the question of operation should be considered at once, and not wait until the patient is in collapse and dying from general septic peritonitis.

# OBITUARIES.

*He gave his honors to the world again,*
*His blessed past to Heaven, and slept in peace.*

HENRY viii, Act iv, Sc. 2.

# STEPHEN GOODALE RISLEY, M.D., ROCKVILLE.

BY WILLARD N. SIMMONS, M.D., CLERK OF THE TOLLAND COUNTY MEDICAL ASSOCIATION.

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Stephen Goodale Risley was the fourth child of a family of seven children. He was the son of Nancy (Goodale) and Winton Risley, and was born in East Windsor, Connecticut, May 11th, 1820. His early education was obtained at the common schools of his native town, and later from the select schools of Westfield and Wilbraham, Massachusetts, where he fitted himself for teaching. He afterwards taught and was employed in the highest grades of the public schools, for six years in the town of Enfield, Connecticut, during the winter season, and in the summer taught a select school in the center of the town, with marked success, where the study of higher English branches was pursued. It was said of him that he seemed to possess that rare ability to impress his pupils with a desire to acquire information, and to inspire them with love for study and application, and it was remarkable to see how a class under his manipulation and guidance would wake up to enthusiastic work. A large number of young people in that community at the time came under his influence and teaching, and many of them have since taken respectable positions in mercantile, professional, and literary pursuits, looking back with precious memories and grateful pride, to the beloved teacher who thus early rendered them valuable service, and gave them, possibly, their first step towards success. And, too, in estimating the efficiency and originality of the genius of the teacher in this respect, we must remember that at the time of which we speak, fifty years ago, our normal schools were not established, nor the principles of pedagogy, as we now have them, formulated.

Dr. Risley began the study of medicine with Dr. H. A. Grant, of Hartford, formerly of Enfield, as his preceptor, and was graduated from the Medical Department of the City of New York, March

5th, 1846. In the July following he located at Tolland, and began the practice of medicine in that town, removing to Thompsonville, Ct., in the autumn of 1846, where he continued in practice and married for his first wife Elizabeth King, of Vernon, Conn., in 1849. He afterwards removed to Vernon, where one son was born to them, and the death of his wife occurred in 1851. After the death of his wife he discontinued the practice of his profession for a time and going to New York, he took a post-graduate course in the College of Physicians and Surgeons, of that city, where he also had access to the wards of the New York and Bellevue Hospitals, as well as to many other public institutions of the city, for the treatment of medical and surgical cases of endless variety. In April, 1853, he located permanently in Rockville, Conn., where he again took up the practice of medicine, and in 1854 married for his second wife Emerett Scott, daughter of Dr. William Scott, of Manchester, Conn. Four children were the result of this union.

Dr. Risley served the town of Vernon as selectman in 1858, and was made a member of the Tolland County Medical Association at its annual meeting held in Tolland, April 21st, 1859, and was one of the oldest members at his death, having many times held all the various offices, (excepting Clerk,) pertaining thereto. He was also a member of the Connecticut Medical Society, and had been a delegate to it from the local County Association many times. Dr. Risley also served as Representative in the General Assembly one term from the town of Vernon, and was a member of the school-board for many years, too, serving as school-visitor from 1877 to 1884, six years, and Chairman of the board many years. He was always deeply interested in school and educational matters of the State, and later, was one of the Building Committee appointed to build the new High School in Rockville. During the time of the draft in the late war he was appointed examining surgeon to decide on the fitness for military duty of men in his county subject to draft. Soon after the war commenced he was appointed by the Government examining surgeon in the Pension Department, which office he held until his death. He was also medical examiner for Vernon, and held many offices of responsibility and trust. Dr. Risley was a mem-

ber and an active worker in the First Congregational Church of Rockville for many years, (now known as the Union Church,) and was a prominent feature in many business and social affairs of his city. He had a large and extensive practice, being called in consultation often with the practitioners of adjoining towns in the county. Dignified, although not stern, he was a man of commanding and professional appearance, careful in manner, both in his treatment of disease and in causing alarm and regret to his patrons by any unnecessary or thoughtless expression. Almost to gentleness he would soothe the afflicted patient, and the more alarmed friend, and the opinion and assurance he gave them was relied upon with confidence and satisfaction. In the latter years of his life he did not engage in so large and extensive a practice as had been his custom in former years, on account of the decline in his health, which was gradual, yet certain, and with the above brief record of life, he passed away, at his home in Rockville, on the second day of August, 1894, aged seventy-four years, after a long and busy life of usefulness.

# WILLIAM AUGUSTUS MUHLENBERG WAINWRIGHT, M.D.

BY E. P. SWASEY, M.D. NEW BRITAIN.

Nearly seven months have passed since, by a fearful accident our friend, Dr. W. A. M. Wainwright, left the circle of our daily lives, our labors and our interests, to enter upon the great unknown. To us it remains to try to make some brief and fitting memorial as far as that can be done in words, to mark his going and to testify to our great loss.

William Augustus Muhlenberg Wainwright, the youngest of the fourteen children of Bishop Jonathan Mayhew Wainwright and Amelia Maria Phelps, the granddaughter of Judge John Phelps, of Stafford, was born August 13th, 1844, in New York City.

Bishop Wainwright, while of English birth, was descended through his mother from Jonathan Mayhew, of Boston. He was born in 1720, of the famous family who for many years acted as governors and missionaries to the Indians of Martha's Vineyard. He was graduated at Harvard, as his fathers before him had been, and was pastor of the West Church, of Boston, until the age of forty-six, when he died, as we are told, "in the beauty of unblemished manhood, consumed by his fiery zeal."

He was an ardent patriot of the very highest and best type, a scholar, a thinker, a prophet in fact. His famous sermon in regard to Charles I, the so-called martyr-king, has been called the "Morning Gun of the Revolution." He was companion and councillor with James Otis and Samuel Adams, and upon his too early death-bed he wrote to Otis, urging the union of the colonies. His daughter, Elizabeth, became the mother of Jonathan Mayhew Wainwright. Born in Liverpool, in 1793, graduated from Harvard in 1812, ordained to the Episcopal ministry in Hartford in 1818, he became a most finished and elegant scholar, a brilliant pulpit orator, a writer of books and a lover of music. He was honored by Oxford University with the degree of D.C.L., and in 1852 was made provisional Bishop of

New York. He traveled extensively for those days, and died in New York City in 1854. He was much lamented and a church was erected to his memory. Among his dear friends was the gifted and saintly William Augustus Muhlenberg, the poet, preacher and philanthropist. For him he named the subject of this sketch.

We make brief note of these two men, the great-grandfather and the father of our friend, since in knowing them we have the key to much of the beauty and excellence of his own character. The first conditions for success in life were fulfilled in him—he was nobly born and well named.

We next see him, a little fellow of seven years at a boarding-school in White Plains, placed there thus early because his parents were abroad. Fitted for college in New York City, he entered Trinity in 1860, from whence he was graduated in 1864. He studied medicine in New York under the tuition of Drs. Alexander Hosack and Henry B. Sands, and took the regular course in the College of Physicians and Surgeons. He entered the New York Hospital on the Second Surgical Division in 1866, taking his degree of medicine the following spring. After two years faithful and honorable service in the New York Hospital, he settled in Hartford in the practice of his profession, where he has since lived. During this preparatory period he was one of the volunteers at the Red House Hospital during the cholera epidemic in New York, and also acted as volunteer in the New York draft riots.

Just midway in his life, in 1869, he was married to Helena Barker Talcott, daughter of the late Thomas Grosvenor Talcott, of Hartford. Of their eleven children, four are living, Mabel Wyllys, Jonathan Mayhew, Elizabeth Mayhew and Philip Stanley. The labors of his twenty-five years of service have been as manifold as his abilities were varied and excellent. Since 1872 he has been connected with the Hartford Hospital. In 1890 he was elected a member of the Board of Medical Visitors to the Retreat for the Insane. For ten years he held the position of assistant surgeon of the first company, Governor's Foot Guard, while that command was under the late Maj. John C. Kinney. He was medical supervisor of various insurance companies, a

member of the State Medical Society and President of the Hartford County Medical Society at its one hundredth anniversary, delivering the address. He was a member of the American Medical Association. He has written various valuable papers relating to his profession. Since '87 he has been a trustee of Trinity College. As a surgeon, he ranked very high in a city where there are many of note, while in the homes of suffering he was for many years the beloved physician.

His social qualities were strongly marked. His ready wit and fund of anecdote made him a most agreeable companion, and being balanced with tact and wisdom, caused him to be much in request at as many social and civic functions as a busy doctor can find time for. He was the first secretary of the Hartford Club, and one of its charter members and a member of the Board of Managers of the Connecticut Society of the Sons of the American Revolution.

It is not remarkable that this son of eminent divines should have been a faithful churchman. For thirty years he was a communicant and for twenty years a vestryman of St. John's church, often serving as a delegate to the State Diocesan conventions and twice was a member of the General Conventions; at New York in '89 and at Baltimore in '90. He did much to inaugurate the St. Andrew's Brotherhood in St. John's church and was himself an interested member of this most excellent order.

Thus briefly can be traced the outline of a most useful and active life, but many more words would be needed should we attempt to even sketch the result of all this activity in so many directions as seen in that indestructable product which we call character. The exactions of our most trying profession, it may be, wore upon a nature sensitive to impressions and at the same time peculiarly frank and outspoken and we may here quote what a life-long friend and brother physician has said of Dr. Wainwright:

"If perchance he criticised, as he was able and wont to do, and sometimes as we thought severely, no one realized it more than he himself, for I have heard him say, 'I speak my mind so freely that everybody dislikes me.' But we can bear witness

that if he ever criticised unfairly he misunderstood or had been misinformed and no man was quicker than he to correct any such error. It is always the man who on the one hand is ready to apologize and on the other is as quick to forgive that makes the many and lasting friendships. There was nothing of malice stored up in his heart, he was frank and outspoken, generous and noble in all his impulses."

An attack of La Grippe in the winter of '93 left Dr. Wainwright with health slightly impaired and the loss was one which he did not seem able to make good. In February, of '94, he made a brief visit to the Burmudas, hoping to get back his strength and vivacity. Again, in August, he spent a month in the Catskills with his only sister, and though everything that love and care could devise was done for his comfort and cheer, it was only too evident to those who knew him best that disease was overmastering him. Still he made a brave fight and did his work day by day often, no doubt, in great weariness.

Elm Street, where he resided, was in September infested with burglars, and to prepare against an anticipated visitation from them, on September 23rd Dr. Wainwright, directly after luncheon, went to his room and got out a revolver, long disused, to put it in order against need. Then followed the tragedy, still so fresh in our minds; the gathering about him of his brother physicians, and his words, so like him, calmly said, "Gentlemen, I place myself in your hands," as he submitted to the laparotomy which disclosed the course of the fatal ball and showed the havoc it had made.

This operation, by arresting hemorrhage, doubtless prolonged his life, and gave him the time in which to say the many things he desired to say for the comfort and direction of those he was so surely leaving. It afforded him time to receive from the hands of his clergyman, with his family, the emblems of his Heavenly Master's suffering and death, and to pass out of this life into the next, although so suddenly, yet not with unseemly haste, but as befits so solemn a step. Said one who stood by him through the hours of that trying night, "He has taught me how a Christian should die."

The first keen shock of loss and grief time softens, and looking back over even so brief a space as these seven months, we can realize that it was better that dear Wainwright should go thus than to have lingered here to be the prey of wasting and distressful disease. But he has gone; no longer do we see him in his prime of manly beauty, no longer hear his quick and gleeful wit or his wise and faithful counsel. His strength and right-mindedness, his courteous grace, his gentleness and hospitality we must cherish as a memory, since we can no longer have them in reality.

## GEORGE CLIFTON GAY, M.D., OF WATERBURY.

BY AUGUSTIN A. CRANE, M.D., OF WATERBURY.

George Clifton Gay was born in Washington County, New York, October 29th, 1869.

After attending the local school he went, at the age of fifteen, to the academy, at Cambridge, New York.

In 1890 he graduated at the Medical Department of the University of Michigan, after pursuing a full course of study there, and went at once to New York to pursue graduate studies.

He had an unusual faculty of making and keeping warm friends wherever he went, and with an exceedingly pleasing address and thorough devotion to his profession, he was enabled to obtain the best clinical advantages in the Metropolis.

He enjoyed the facilities offered for work and study at the Chambers Street Hospital, New York Dispensary, Eye and Ear Infirmary, and Vanderbilt Clinic, and served as Instructor in Practical Anatomy and Operative Surgery at the Post-Graduate Medical School, besides serving a full term as Intern at the New York Cancer Hospital.

His health, which had always been delicate, proved unequal to the labor and confinement of a New York practice, and he gave up a very promising field in that city and came to Waterbury in May, 1893.

In Waterbury his health seemed at first to be so greatly improved as to promise an extremely successful career, as he was possessed to a marked degree of the qualities which go to make up a successful practitioner.

He immediately made warm and lasting friendships with all whom he met in his new field, and almost at once surrounded himself with a numerous clientele of patients. But no sooner did he become busy at his chosen work, than his constitution showed itself unequal to the task imposed upon it by his assiduity, and he was repeatedly prostrated, only to attack his work again after a few days with renewed vigor.

At his periods of extreme bodily and mental prostration, he showed eccentricities which his family and intimate friends ascribed to mere despondency, but which in the light of after events, show clearly to have been the manifestations of mental aberration.

Still his determination was great, and he resolutely kept at his work when poorly able to do so, and maintained a successful and even brilliant career as a practitioner.

In the fall of 1894, after two weeks severe sickness, he went to Florida and came back in February, 1895, with the appearance of perfect health, and began with characteristic resolution to take up the line of his busy work where he left it off in the fall.

To all except the few who knew him best, it seemed that he was on a permanent basis of bodily and mental soundness, when on March 22, 1895, after two days of profund depression and ungrounded despondency, he took his own life, cutting short an extremely promising career.

His loss was a personal bereavement to hundreds of patients, and to his colleagues.

He married Virginia Clark, in Westfield, New Jersey, in April, 1893.

Besides his widow, his two parents and two brothers and two sisters survive, and all now recall instances in the past which clearly show the vein of insanity which finally terminated his life.

## HENRY SMITH WILDMAN, M.D., OF WATERBURY.

BY AUGUSTIN A. CRANE, M.D., OF WATERBURY.

Henry Smith Wildman was born in Brookfield, Conn., February 16, 1853.

He spent two years at the Danbury High School, and one year at a private school in Brookfield

In 1874 he went to the far West and for the next eleven years was engaged in mining, surveying, and prospecting, during which time he travelled over nearly all the Western States, being located mostly in Colorado, Dakota, and New Mexico.

In 1885 he returned East and entered upon the study of medicine with Dr. F. P. Clark, Danbury.

In 1886 he entered the College of Physicians and Surgeons, New York, where he remained one year, but was obliged to leave, being called home on account of the death of his father.

In 1887 he entered the Long Island Hospital Medical College, graduated there in 1889, and opened an office in Waterbury shortly after graduation.

During his five years of practice in Waterbury he made warm friends by his quiet, unassuming, courteous manner, and his uniform fairness and honorable dealings with all.

He had built up a comfortable practice and was happy in the anticipation of an especially pleasant and congenial home life, when, exhausted by day and night work in his practice, and constant attendance upon some very sick patients, he succumbed to an attack of acute pneumonia, and died from edema of the lungs on January 18, 1894.

He was a faithful, studious physician, of model habits, who made friends of many and enemies of none.

## NICHOLAS J. HANLON, M.D., OF WATERBURY.

BY AUGUSTIN A. CRANE, M.D., OF WATERBURY.

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Nicholas J. Hanlon was born in Waterbury May 8, 1864.

He attended the Waterbury public schools, and St. Michael's College, Toronto. He attended two courses of lectures in the Bellevue Hospital Medical College, studying during vacations with Dr. Walter A. Holmes, of Waterbury. He attended his last course of lectures at Dartmouth, where he graduated in 1891.

Dr. Hanlon opened an office in Waterbury soon after his graduation, where he remained for about a year, going from there to Ansonia, where he had entered upon a growing practice.

He overworked himself severely in Ansonia, in the care of smallpox patients in 1894, and soon found his health permanently undermined.

He died January 25th, 1895, of consumption, leaving a widow, formerly Miss Nettie Laidlaw, whom he married in 1893, in Hanover, N. H.

# MEMBERS OF THE SOCIETY.

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| ARTHUR WARD, | Newark, N. J. |
| PAUL AUGUSTINE STACKPOLE, | Dover, N. H. |
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| DAVID WEBSTER, | New York City. |
| ALEXANDER J. C. SKENE, | Brooklyn, N. Y. |
| SIR JAMES GRANT, | Ottawa, Canada. |
| HENRY O. MARCEY, | Boston, Mass. |

# ACTIVE MEMBERS.

*The Names of those who have been Presidents are in Capitals.*

## HARTFORD COUNTY.

IRVING WHITALL LYON, M.D., of Hartford, President.

GEORGE K. WELCH, M.D., of Hartford, Clerk.

*County Reporter*—CHARLES E. TAFT, M.D., of Hartford.

*Censors*—HORACE S. FULLER, M.D., GEORGE CLARY, M.D., SIDNEY R. BURNAP, M.D.

Annual Meeting, Third Wednesday in April.

HARTFORD:

GURDON W. RUSSELL, No. 207 Farmington Avenue.
Pinckney W. Ellsworth, No. 123 Pearl Street.
ASHBEL W. BARROWS, No. 189 High Street.
Panet M. Hastings, No. 130 Capitol Avenue.
Henry P. Stearns, No. 190 Retreat Avenue.
Irving W. Lyon, No. 26 Buckingham Street.
MELANCTHON STORRS, No. 91 Ann Street.
Horace S. Fuller, No. 95 Trumbull Street.
John O'Flaherty, No. 116 Main Street.
Nathan Mayer, No. 268 Main Street.
William M. Hudson, No. 105 Elm Street.
George C. Jarvis, No. 98 High Street.
David Crary, No. 490 Main Street.
John B. Lewis, No. 56 Prospect Street.
Daniel T. Bromley, No. 123 Pearl Street.
Gustavus P. Davis, No. 56 Prospect Street.
James Campbell, No. 34 Congress Street.
Charles E. Froelich, No. 49 Pratt Street.
John Dwyer, No. 13 Charter Oak Street.
Harmon G. Howe, No. 137 High Street.
William T. Bacon, No. 3 Pratt Street.
William W. Knight, No. 105½ Trumbull Street.
Thomas D. Crothers, Fairfield Avenue.
George L. Parmele, No. 25 Pratt Street.
Ellen F. H. Gladwin, No. 705 Asylum Street.
Samuel B. St. John, No. 26 Pratt Street.
George R. Shepherd, No. 32 Farmington Avenue.
Frederick S. Crossfield, No. 26 Pratt Street.
Marcus M. Johnson, No. 74 Pearl Street.
William D. Morgan, No. 238 Main Street,
John F. Axtelle, No. 211 Main Street.
Noah Cressy, No. 214 Pearl Street.
George K. Welch, No. 94½ Trumbull Street.
Phineas H Ingalls, No. 112 High Street.
Edward K. Root, No. 238 Main Street.

Luther A. Davison, No. 3 Pratt Street.
John Howard, No. 119 Trumbull Street.
Charles D. Alton, No. 3 Pratt Street.
Oliver C. Smith, No. 40 High Street.
Joseph E. Root, No. 49 Pearl Street.
William Porter, Jr., No. 391 Allyn Street.
John J. Morrissey, No. 643 Main Street.
Frederick T. Simpson, No. 122 High Street.
George R Miller, No. 182 High Street.
Charles C. Beach, No 199 Main Street.
Gideon C. Segur, No. 67 Farmington Avenue.
George C. Bailey, No. 65 Church Street.
Alva E. Abrams, No. 78 High Street.
Charles E. Taft, No. 98 High Street.
Samuel B. Childs, No. 18 Pratt Street.
Thomas F. Kane, No. 141 Main Street.
Arthur J. Wolff, No. 71 Capitol Avenue.
Ansel G. Cook, No. 164 High Street.
Mrs. L. Darnstadt Kean, No. 253 Main Street.
Edwin A. Down, No. 190 Retreat Avenue.
Daniel F. Sullivan, No. 64 Church Street.
Joseph H Cahill, No. 51 Church Street.
Everett J. McKnight, No. 370 Asylum Street.
Benjamin S. Barrows, No. 78 High Street.
H. Walter Murlless, No. 55 Church Street.
Michael A. Bailey, No 65 Church Street.
George N. Bell, No. 19½ Pratt Street.
Frank L. Waite, No. 26 Pratt Street.
Charles S Stern, No. 268 Main Street.
Oliver K. Isham, No. 44 Church Street.
Franklin L. Lawton, No. 657 Main Street.
John H. Rose, No. 12 Garden Street.
John B. Waters, No. 103 Trumbull Street.
Joseph B. Hall, No. 21½ Pratt Street.
Edward O. Elmer, No. 61 Francis Avenue.
Janet M. Weir, No. 31 Spring Street.

BERLIN:
Robert E. Ensign,
Charles A. Gillin.

BRISTOL:
John J. Wilson,
William W. Horton.

CANTON—Collinsville:
George F. Lewis,
Ida Rachel Gridley Case,
William H. Crowley,
George L. Woods.

EAST HARTFORD:
Edward H. Griswold,
Thomas J. O'Connell,
Walter G. Murphy,
*Charles A. Fox,

Burnside:
Franklin H. Mayberry.

EAST WINDSOR—Broadbrook:
Howard O. Allen.

Warehouse Point:
Philip H. Sellew.

ENFIELD—Thompsonville:
Edward F. Parsons,
Rial L. Stricklaud,
George T. Finch,
John F. Dowling.
Henry G. Varno.

Hazardvile:
Simon W. Houghton.

FARMINGTON:
Franklin Wheeler,
Charles Carrington.

GLASTONBURY:
Henry C. Bunce,
Charles G. Rankin.

South Glastonbury:
Henry M. Rising.

MANCHESTER:
Francis H. Whiton,
John T. Dooley.
John C. Taylor.

*Exempted from taxation.

South Manchester :
Julian N. Parker,
William R. Tinker,
Thomas H. Weldon.

New Britain :
*BENJAMIN N. COMINGS,
*George Clary,
Edwin B. Lyon,
Jay S. Stone,
Erastus P. Swasey,
Michael J. Coholan,
George J. Holmes,
Lawrence M. Cremin,
Wilbur T. Bunuell,
Samuel W. Irving,
John B. Poyer,
James F. Donahue,
Henry Doutteil,
Richard F. Brown,
Robert M. Clark.
Kanut A. Enlind.

Peainville :
John N. Bull,
Theodore G. Wright.

Rocky Hill :
*Rufus W. Griswold,
Henry B. Plunkett.

Simsbury - Tariffville :
Charles M Wooster.

Southington :
Willard G. Steadman.

South Windsor :
Mary S. Tudor.

Suffield :
Jarvis K Mason,
Matthew T. Newton,
Philo W. Sweet.

Wethersfield :
*Abner S. Warner,
*Roswell Fox,
Edward G. Fox,
Arthur W. Howard.

Windsor :
*Samuel A. Wilson,
Newton S. Bell.

Windsor Locks :
Sidney R. Burnap,
Joseph A. Coogan. —138

## NEW HAVEN COUNTY.

OLIVER J. D. HUGHES, M D., of Meriden, President.

Gustavus Eliot, M.D., of New Haven, Vice President.

Joseph H. Townsend, M.D., of New Haven, Clerk.

*County Reporter*—Augustin A. Crane, M.D., Waterbury.

*Censors*—Francis Bacon, M.D., C. S. Rodman, M.D.,
C. W. Gaylord, M.D.

Annual Meeting, third Thursday in April ; semi-annual, third Thursday in October.

New Haven :
David L. Daggett, No. 60 Wall Street.
S. G. Hubbard, No. 23 College Street.
C. A. LINDSLEY, No. 15 Elm Street.
John Nicoll, No. 86 Broadway.
Moses C. White, No. 48 College Street
Leonard J. Sanford, No. 216 Crown Street.
F. L. Dibble, No. 257 Church Street.
T. H. Bishop, No. 215 Church Street.
FRANCIS BACON, No. 32 High Street.
W. L. Bradley, No. 203 Crown Street.
A. E. Winchell, No. 60 Pearl Street.
Robert S. Ives, No. 347 Temple Street.
Evelyn L. Bissell, No 308 Crown Street.
Arthur Ruickoldt, No. 71 Olive Street.
Walter Judson, No. 1145 Chapel Street.
D. C. Leavenworth, No. 75 Howe Street.
Frederick Bellosa, No. 209 Orange Street.
S. H. Chapman, No. 193 Church Street.

*Exempted from taxation.

J. P. C. Foster, No. 109 College Street.
F. O. White, No. 514 Howard Avenue.
W. H. Carmalt, No. 87 Elm Street.
M. A. Cremin, No. 129 Olive Street.
T. H. Russell, No. 137 Elm Street.
F. H. Whittemore, No. 13 Elm Street.
C. P. Lindsley, No. 37 Elm Street.
H. Fleischner, No. 928 Grand Avenue.
M. Mailhouse, No. 151 Meadow Street.
M. C. O'Connor, No. 882 State Street.
Charles E. Park, No. 132 Olive Street.
F. E. Beckwith, No. 139 Church Street.
Gustavus Eliot, No. 209 Church Street.
J. E. Stetson, No. 106 High Street.
J. F. Luby, No. 667 Grand Avenue
William W. Hawkes, No. 35 High Street.
Frank H. Wheeler, No. 221 Crown Street.
Herbert E. Smith, Medical College.
Benjamin L. Lambert, No. 358 Howard Avenue.
F. W. Wright, No. 48 Pearl Street.
S. D. Gilbert, No. 29 Wall Street.
Edward K. Roberts, No. 244 Grand Avenue.
Oliver T. Osborne, No. 252 York Street.
Lucy M. Peckham, No. 144 Green Street.
William G. Daggett, No. 189 Church Street.
Louis S. DeForest, No. 54 Wall Street.
Henry L. Swain, No. 232 York Street.
Mary B. Moody, Sherland Avenue, Cor. E. Grand Avenue.
E G. Madden, No. 228 Congress Avenue.
G. F. Converse, Junction Whalley Avenue and Goffe Street.
J. H. Townsend, No. 93 Howe Street.
T. M. Cahill, No. 227 Franklin Street.
C. J. Foote, No. 305 Howard Avenue.
Marvin Smith, No. 4 Pearl Street.
S. J. Maher, No. 212 Orange Street.
Jay W. Seaver, No. 25 Lynwood Street.
Louis B. Bishop, No. 77 Whitney Avenue.
H. W. Ring, No. 46 Elm Street.
W. C. Welch, No. 44 College Street.
A. O. Baribault, No. 528 Chapel Street.
J. F. Baker, No. 695 Grand Avenue.
Rollin McNeil, No. 149 Bradley Street.
Edward M. McCabe, No. 383 Howard Avenue.
James M. Reilly, No. 337 Cedar Street.
Clarence E. Skinner, No. 318 Orange Street.
N. R. Hotchkiss, No. 150 Shelton Avenue.
Benjamin A. Cheney, No. 40 Elm Street.
Charles A. Tuttle, No. 129 Whalley Avenue.
Harry A. Elcock, No. 226 Crown Street.
Louis J. Gaynor, No. 159 Orange Street.
Harry B. Ferris, No. 317 Crown Street.
Austin B. Fuller, No 632 Chapel Street.
Moses J. Hasinsky, No. 156 Congress Avenue.
Edward S. Thomson, No 1079 Chapel Street.
Henry F. Kienke, No. 758 Grand Avenue.
Leonard W. Bacon, Jr., No. 294 Elm Street.
Paul S. Robinson, No. 164 Grand Avenue.
A thur N. Alling, No. 214 Crown Street.
A. W. Evans, No. 12 High Street.

R. A. McDonnell, No 312 Elm Street.
E. P. Pitman, No. 52 Sylvan Avenue.
James A. Moore, No. 223 Grand Avenue.
Isaac N. Porter, No. 194 Dixwell Avenue.
Woodburn R. Avis, No. 1432 Chapel Street.
Ernest H. Arnold, No. 15 Wall Street.
Robert E. Peck, No. 486 Elm Street.
Robert H. McNair, No. 343 Howard Avenue.
Daniel A Jones, No. 746 Chapel Street.
William C. Wurtemberg, No. 38 Elm Street.

Westville :
A. W. Marsh.

ANSONIA :
Louis E. Cooper,
Frederick C. Goldstein.

BRANFORD :
C. W. Gaylord,
Walter Zink,
A. J. Tenny,
A. J. Varno.

CHESHIRE :
M. N. Chamberlin,
E. T. Cornwall

DERBY :
Birmingham :
T. J. O'Sullivan,
F. N. Loomis,
R. J. Barry,
R. M. Griswold,
Royal W. Pinney.

GUILFORD :
George H. Beebe.

HAMDEN :
E. D. Swift,
†O. F. Treadwell.

MADISON :
*D. M. Webb.

MERIDEN :
*Asa H. Chnrchill,
C. H. S. Davis,
N. Nickerson,
A. W. Tracy,
E. T. Bradstreet,
Anna J. Ferris,
J. D. Eggleston,
Edward W. Smith,
O. J. D. Hughes,
Ava H. Fenn,
E. W. Pierce,
F. P. Griswold,
E. D Hall,
H. W. Delesdernier,
H. A Mecks,
Johu L. Gartland,
William Galvin.

MILFORD :
*Hnll Allen,
E. B. Heady,
E. C. Beach.

NAUGATUCK :
Frank B. Tuttle,
Thomas M. Bull,
Frederick A. Spring,
James W. Robbins,
William J. Delaney,
Edwin H. Johnson.

NORTH HAVEN :
R. B. Goodyear.

ORANGE—West Haven :
J. F. Barnet,
William V. Wilson,
Dnrell Shephard.

OXFORD :
Lewis Barnes.

SEYMOUR :
Frank A. Benedict,
Patrick F. Strapp.

SOUTHBURY :
Myron L. Cooley.

WALLINGFORD :
J. D. McGaughey,
C. H. Atwater,
William S. Russell,
William P. Wilson.
Frank E. Condert.

WATERBURY :
Edward L. Griggs,
F. E. Castle,
E. W. McDonald,
Walter H. Holmes,
Walter L. Barber,
C. W. S. Frost,
F. M. Cannon,
Charles S. Rodman,
J. M. Benedict,
Thomas L. Axtelle,
Carl E. Munger,
Bernard A. O'Hara,
Johu F. Hayes,

†P. O. New Haven.

*Exempted from taxation.

WATERBURY:
Caroline R. Conkey,
Augustin A. Crane,
Patrick T. O'Connor,
John D. Freney,
Charles A. Hamilton,
George O. Robbins,
Charles H. Brown,
Edward W. Goodenough,
Isaac P. Fiske. —166

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## NEW LONDON COUNTY.

JULIAN LA PIERRE, M.D., of Norwich, President.

MYRON W. ROBINSON, M.D., of Colchester, Vice President.

CHARLES B. GRAVES, M.D., of New London, Clerk.

*County Reporter*—CHARLES B. GRAVES, M.D., of New London.

*Censors*—L. S. PADDOCK, M.D., WM. M. BURCHARD, M.D., F. N. BRAMAN, M.D.

Annual Meeting, first Thursday in April: semi-annual, first Thursday in October.

COLCHESTER:
Myron W. Robinson,
EAST LYME—Niantic:
Frederick H. Dart,
Edward C. Chipman.
GRISWOLD—Jewett City:
George H. Jennings.
GROTON:
Edmond P. Douglas.
LYME:
Charles De Witt Voorhes.
MONTVILLE:
*John C. Bolles,
Morton E. Fox.
Uncasville:
William M. Burchard.
NEW LONDON:
A. W. Nelson,
F. N. BRAMAN,
J. G. Stanton,
F. J. Beckwith.
J. E. Cronin,
Charles B. Graves.
Joseph R. Crofton,
Elisha Munger,
Hiram B. Thomson.
John N. Dimon,
Harold H. Heyer.
NORWICH:
Lewis S. Paddock,
William Witter,
William S. C. Perkins,
Patrick Cassidy,
L. B. Almy,
Anthony Peck,
Julian LaPierre,
E. P. Brewer,
N. P. Smith,
Patrick H. Harriman,
W. K. Tingley,
W. T. Browne,
George R. Harris,
Charles H. Perkins,
Rush W. Kimball,
William A. Korn,
Charles V. Buttler.
Taftville:
George Thompson,
F. W. Pirritte.
STONINGTON:
Charles E. Brayton,
George D. Stanton.
Mystic:
*Albert T. Chapman,
William H. Gray.
Mystic Bridge:
Frank A. Coates,
A. M. Purdy.
VOLUNTOWN:
Warren Russell Davis.
WATERFORD:
George M. Minor. —47

*Exempted from taxation.

## FAIRFIELD COUNTY.

FREDERICK B. BAKER, M.D., of East Norwalk, President.

J. W. WRIGHT, M.D., of Bridgeport, Vice President.

L. T. DAY, M.D., of Westport, Clerk.

*County Reporter*—C. R. HEXAMER, M.D., of Stamford.

*Censors*—F. M. WILSON, M.D., M. V. B. DUNHAM, M.D., W. S. WATSON, M.D.

Annual Meeting, second Tuesday in April, at Bridgeport: semi-annual in October.

BRIDGEPORT:

ROBERT HUBBARD, No. 254 State Street.
Andrew J. Smith, No. 85 Barnum Avenue.
GEORGE L. PORTER. No. 266 State Street.
Robert Lander. No. 192 Fairfield Avenue.
Curtis H. Bill, No. 285 State Street.
N. E. Wordin, No. 174 Fairfield Avenue.
F. M. Wilson, No. 317 State Street.
T. F. Martin, No. 115 Golden Hill Street.
W. H. Bunnell, No. 130 Seaview Avenue.
F. B. Downs, No. 256 State Street.
W. C. Bowers, No. 242 State Street.
F. A. Rice, No. 91 West Avenue.
J. W. Wright, No. 229 State Street.
A. W. Lyons, No. 289 State Street.
A. A. Holmes, No. 139 Fairfield Avenue.
Charles C. Godfrey, No. 254 State Street.
S. M. Garlick, No 316 State Street.
Henry Blodget, No. 313 State Street.
J. C. Lynch, No. 252 State Street.
C. C. Hoyt, No. 623 State Street.
G. W. Osborn, No. 339 Broad Street.
J. R. Topping, No. 131 East Main Street.
B. W. White, No. 276 State Street.
Jacob May, No. 348 Broad Street.
F. C. Graves, No. 309 State Street.
G. B. Cowell, No. 120 East Washington Avenue.
C. N. Haskell, No. 254 State Street.
Frank L. Smith, No. 10 N. Washington Avenue.
George E. Ober, No. 129½ E. Main Street.
B. DeF. Sheedy, No. 311 State Street.
Russell T. Bishop, No. 343 State Street.
D. C. DeWolfe, No. 289 Fairfield Avenue.
Harry S. Miles, No. 317 State Street.
Charles S. Banks, No. 254 State Street.
Fessenden L. Day, No. 313 State Street.
Edward Fitzgerald, No. 126 E. Washington Avenue.
George S. Ford, No. 231 State Street.

BETHEL:

A. E. Barber,
Charles R. Hart.

BROOKFIELD.

*A. L. Williams,
Junius F. Smith.

DANBURY:

F. P. Clark,
A. T. Clason,
Wm. F. Lacey,
E. E. Snow,
E. A. Stratton,

*Exempted from taxation.

DANBURY—*Continued:*
W. S. Watson,
A. L. Scott,
William C. Wile,
D. Chester Brown,
W. F. Follansbee,
Richard Ellis,
H. F. Brownlee,
John H. Benedict,
Nathaniel Selleck,
Clayton P. Bennett,
William F. Wood.

DARIEN—Noroton:
William F. French,
WM. G. BROWNSON,
John Joseph Kindred.

FAIRFIELD:
W. H. Donaldson.

Greenfield Hill:
M. V. B. Dunham.

Southport:
C. H. Osborne.

GREENWICH:
W. L. Griswold,
T. M. Franklin,
Spencer Franklin,
Frank Terry Brooks.

HUNTINGTON—Shelton:
Gould A. Shelton,
D. A. Richardson,
William S. Randall.

MONROE:
John G. Stevens.

Stepney:
SETH HILL.

NEWTOWN:
Edward M. Smith.

Sandy Hook:
Dana P. Richardson.

NORWALK:
James G. Gregory,
R. L. Higgins,
S. H. Huntington,
William J. Tracey.

South Norwalk:
George W. Benedict,
W. C. Burke, Jr.,
A. N. Clark,
C. G. Bohannan,
Lauren M. Allen.

East Norwalk:
Frederick B. Baker.

RIDGEFIELD:
Russell W. Lowe.

STAMFORD:
H. P. Geib,
A. M. Hurlbutt,
Samuel Pierson,
A. N. Phillips,
C. R. Hexamer,
P. P. Van Vleet,
F. H. Schavoir,
Wm. A. B. Treadway,
Lawrence S. Buckley,
F. P. Rogers,
E. J. Meeks,
Roswelle G. Philip,
James A. Meek,
George Sherrill,
Nathaniel P. Washburne,
Watson E. Rice.

STRATFORD:
W. B. Cogswell,
G. Fred. Lewis.

WESTON—Lyon's Plain:
F. Gorham.

WESTPORT:
George B. Bouton,
F. Powers,
Loren T. Day,
F. D. Rulund.

WILTON:
A. B. Gorham.

GEORGETOWN:
Howard P. Mansfield.

SOUTH WILTON:
Edward Everitt Smith.

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## WINDHAM COUNTY.

F. A. MORRELL, M.D., of Putnam, President.

FRANK E. GUILD, M.D., of Windham, Vice President.

W. H. JUDSON, M.D., of Danielsonville, Clerk.

*County Reporter*—NATHANIEL HIBBARD, M.D., of Danielsonville.

*Censors*—T. M. HILLS, M.D., LOWELL HOLBROOK, M.D.,
E. H. DAVIS, M.D.

BROOKLYN :
A. H. Tanner.

KILLINGLY :
Ashael E. Darling,
Henry F. Hammond.

Danielsonville :
Rienzi Robinson,
Nathaniel Hibbard,
W. H. Judson,
C. J. Le Clair.

East Killingly :
Edwin A. Hill,
Charles E. Hill.

PLAINFIELD :
E. H. Davis.

Moosup :
Charles N. Allen,
W. W. Adams.

Central Village :
*Charles H. Rogers.

POMFRET :
S. B. Overlock.

PUTNAM :
*H. W. Hough,
John B. Kent,
F. A. Morrell,
Omar LaRue,
Warren W Foster.

THOMPSON :
LOWELL HOLBROOK.

No. Grosvenordale :
J. F. McIntosh.

WINDHAM :
F. E. Guild.

Willimantic :
Frederick Rogers.
T. MORTON HILLS,
*O. B. Griggs,
C. J. Fox,
T. R. Parker,
John Weldon,
James Jay Smith,
A. D. David,
C. H. Girard,
R. C. White,
*Farnam O. Bennett. —32

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## LITCHFIELD COUNTY.

FREDERICK H. WIGGIN, M.D., of Litchfield, President.

ELIAS PRATT, M.D., of Torrington, Vice President.

JAMES T. SEDGWICK, M.D., of Litchfield, Clerk.

*County Reporter*—JOHN C. KENDALL, M.D., of Norfolk.

*Censors*—J. C. KENDALL, M.D., R. S. GOODWIN, M.D.,
C. O. BELDEN, M.D.

Annual Meeting, second Tuesday in October ; semi-annual, fourth Tuesday in April.

CANAAN :
C. W. Camp,
F. H. Lee.

CORNWALL—West Cornwall :
J. A. Livingston.

Cornwall Bridge :
W. M. S. Curtis.

GOSHEN :
J. H. North.

LITCHFIELD :
C. O. Belden,
F. H. Wiggin,
J. T. Sedgwick,
John L. Duel,
William S. MacLaren.

NEW HARTFORD :
Jerry Burwell,
Josiah Swett.

NEW MILFORD—Gaylordsville :
H. B. Griswold.

NORFOLK :
John C. Kendall,
I. L. Hanmant.

PLYMOUTH—Terryville :
W. P. Sweet,
W. W. Wellington.

SALISBURY :
H. M. Burtch.

Lakeville :
W. Bissell,
George H. Knight.

*Exempted from taxation.

SHARON:
W. W. Knight,
B. W. Munson,
C. W. Bassett.

THOMASTON:
Ralph S. Goodwin,
George D. Furgnson,
J. W. Johnson.

TORRINGTON:
William L. Platt,
T. S. Hanchett,
Elias Pratt.

WASHINGTON:
ORLANDO BROWN,
William J. Ford.

New Preston:
R. A. Marcy.

WATERTOWN:
W. S. Munger,
Eugene C. French.

WINCHESTER Winsted:
E. L. Pratt,
W. S. Hurlbert.

West Winsted:
John W. Bidwell,
E. H. Welch.

WOODBURY:
L. Y. Ketchum,
D. R. Rodger.

Hotchkissville:
J. S. Bissell. —41

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## MIDDLESEX COUNTY.

JOHN E. BAILEY, M.D., of Middletown, President.

FRANK K. HALLOCK, M.D., of Cromwell, Clerk.

*County Reporter*—F. E. POTTER, M.D., of Portland.

*Censors*—S. W. TURNER, M.D., GEORGE W. BURKE, M.D., FRANK B. LOOK, M.D.

Annual Meeting, fourth Tuesday in April, at Haddam.

CHATHAM—Middle Haddam:
*Albert E. Worthington,
George N. Lawson.

East Hampton:
Albert Field.

CHESTER:
Sylvester W. Turner,
Fred. Sumner Smith.

CLINTON:
Herbert S. Reynolds.

CROMWELL:
Winthrop B. Hallock,
*Frank K. Hallock,
G. W. Lawrence,
Charles F. Bush.

DURHAM:
Earl Mathewson.

EAST HADDAM:
M. W. Plumstead.

ESSEX:
Charles H. Hubbard,
Willis A. Russell.

HADDAM:
Miner C. Hazen,
Selden W. Noyes.

KILLINGWORTH:
E. P. Nichols.

MIDDLETOWN:
*George W. Burke,
F. D. EDGERTON,
Daniel A. Cleaveland,
James Olmstead,
Wm. E. Fisher,
C. E. Stanley,
J. M. Keniston,
H. S. Noble,
M. D. Murphy,
F. B. Look,
John E. Bailey,
A. J. Campbell,
A. B. Coleburn,
J. Francis Calef,
J. E. Loveland,
Kate C. Mead.

OLD SAYBROOK:
J. H. Granniss.

PORTLAND:
C. A. Sears,
F. E. Potter,
R. C. Downey.

SAYBROOK—Deep River:
Edwin Bidwell,
H. T. French.

WESTBROOK:
T. B. Bloomfield. —40

*Exempted from taxation.

## TOLLAND COUNTY.

FREDERICK GILNACK, M.D., of Rockville, President.

EDWIN T. DAVIS, M.D., of Ellington, Vice President.

WILLARD N. SIMMONS, M.D., of Tolland, Clerk.

*County Reporter*—C. B. NEWTON, M.D., of Stafford Springs.

*Censors*—C. F. SUMNER, M.D., E. P. FLINT, M.D.,

W. N. SIMMONS, M.D.

Annual Meeting, third Thursday in April.

BOLTON:
*CHAS. F. SUMNER.
COVENTRY:
William C. Haven.
South Coventry:
Henry S. Dean,
W. L. Higgins.
ELLINGTON:
E. T. Davis.
MANSFIELD—Mansfield Depot:
F. E. Johnson.
ROCKVILLE:
*Francis L. Dickinson,
Frederick Gilnack,
E. K. Leonard,
T. F. Rockwell,
Fred. W. Walsh,
E. P. Flint.
SOMERS:
A. L. Hurd.
STAFFORD—Stafford Springs:
C. B. NEWTON,
T. H. Rafftery,
F. L. Smith.
TOLLAND:
*W. N Simmons
VERNON:
*A. R. GOODRICH. —18

*Exempted from taxation.

# ALPHABETICAL LIST

OF THE

# MEMBERS OF THE CONNECTICUT MEDICAL SOCIETY,

*With date and place of Graduation, and Post-Office Address.*

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Abrams, Alva Eluathan, | Albany, '81, | Hartford. |
| Adams, William Waldo, | Bellevue, '91, | Moosnp. |
| Allen, Charles Noah, | Uuiv. Vt., '81, | Moosup. |
| Allen, Howard Oliver, | Univ. N. Y., '79, | Broad Brook. |
| Allen, Hnll, | Univ. N. Y., '21, | Milford. |
| Allen, Lanren Melville, | P. & S., '80, | Sonth Norwalk. |
| Alliug, Arthnr Nathaniel, B.A., | P. & S., N. Y., '91, | New Haveu. |
| Almy, Leonard Ballon, B.A., '72, | Bellevne, '76, | Norwich. |
| Alton, Charles De Lancey, | Bellevue, '75, | Hartford. |
| Aruold, Ernest Hermann, | Yale, '94, | New Haven. |
| Atwater, Caleb Huntingtou, | P. & S., N. Y., '71, | Wallingford. |
| Avis, Woodbnrne Rozelle, | P. & S., Balt., '94, | New Haveu. |
| Axtelle, John Franklin, | L. I. Coll. Hosp., '71, | Hartford. |
| Axtelle, Thomas Lincoln, | Bellevue, '81, | Waterbury. |
| Bacon, Fraucis, | Yale, '53, | New Haven. |
| Bacon, Leonard Woolsey, Jr., | Yale, '92, | New Haven. |
| Bacon, Wm. Tnrner, B.A., Yale, '68, M.A., '71, | Univ. N. Y., '71, | Hartford. |
| Bailey, George Coruelius, | Univ. N. Y., '86, | Hartford. |
| Bailey, John Elmore, | P. & S., N. Y., '85, | Middletown. |
| Bailey, Michael Angelo, | P. & S., Balt., '93, | Hartford. |
| Baker, Frederick Birdseye, | Univ. Md., '88, | East Norwalk. |
| Baker, John Francis, | L. I. Coll. Hosp., '89, | New Haven. |
| Baldwin, Edward Robinson, | Yale, '90, | Cromwell. |
| Banks, Charles Lincoln, | P. & S., '91, | Bridgeport. |
| Barber, Alvin Elizur, | Berkshire, '54, | Bethel. |
| Barber, Walter Lewis, | Bellevue, '73, | Waterbury. |
| Baribault, Arthur Octave, | Vict. Med. Col., '89, | New Haven. |
| Barnes, Irving Fergusou, | Univ. N. Y., '90, | Colliusville. |
| Barnes, Lewis, B.A., M.A., '47, | Buffalo Univ., '50, | Oxford. |
| Barnett, John Frederick, | Yale, '69, | West Haven. |
| Barrows, Ashbel Ward, | Yale, '41, | Hartford. |
| Barrows, Benj. Safford, Ph.B, '83, | Univ. N. Y., '87, | Hartford. |
| Barry, Robert J., | P. & S., '90, | Birmingham. |
| Bassett, Clarence Wheeler, | Univ. N. Y., '82, | Sharon. |
| Beach, Charles Coffing, | P. & S., N. Y., '82, | Hartford. |
| Beach, Edward Charles, | Yale, '88, | Milford. |
| Beckwith, Frank Edwiu, M.A., '81, | P. & S., N. Y., '71, | New Haven. |
| Beckwith, Fred'k Jasou, B.A., '78, | Harvard, '82, | New London. |

In preparing this list the Secretary has followed the list in the Proceedings of 1892, made with great care and labor by Dr. J. B. Lewis for the Centennial year. It may be relied npon as being correct.

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Beebe, George H., | Univ. N. Y., '78, | Guilford. |
| Belden, Charles Ogilvie, | P. & S., N. Y., '82, | Litchfield. |
| Bell, George Newton, | Yale, '92, | Hartford. |
| Bell, Newton Stephen, | Univ. Vt., '64, | Windsor. |
| Bellosa, Frederick, | Yale, '72, | New Haven. |
| Benedict, Frank Allen, | P. & S , N. Y., '87, | Seymour. |
| Benedict, George Willis, B.A., '74. | P. & S., N. Y., '78, | South Norwalk. |
| Benedict, John Howe, | Conn. Med. Soc., '58, | Danbury. |
| Benedict, John Mitchell. | Univ. N. Y., '82. | Waterbury. |
| Bennett, Clayton Powers, | P. & S., N. Y., '90, | Danbury. |
| Bennett, Farnham Orris, | Berkshire, '59, | Willimantic. |
| Bidwell, Edwin, | Yale, '47, | Deep River. |
| Bidwell, John Welch, | Berkshire, '46, | West Winsted. |
| Bill, Curtis Harvey, | Univ. N. Y., '59, | Bridgeport. |
| Bishop, Louis Bennett, B.A., '86, | Yale, '88, | New Haven. |
| Bishop, Russell Tomlinson, | Bellevue, '93, | Bridgeport. |
| Bishop, Timothy Huggins, | Yale, '60, | New Haven. |
| Bissell, Evelyn Lyman, | Yale, '60, | New Haven. |
| Bissell, Jerome Samuel, | Yale, '94, | Hotchkissville. |
| Bissell, William, B.A., '53, | Yale, '56, | Lakeville. |
| Blodget, Henry, | Bellevue, '81, | Bridgeport. |
| Bloomfield, Thomas Blanch, | P. & S., N. Y., '76, | Westbrook. |
| Bohannan, Charles Gordon, | Univ. N. Y., '78, | South Norwalk. |
| Bolles John Calvin, | Vt. Med. Col., '40, | Montville. |
| Bonton, George Beriah, | Y., '56; N. Y. M., '56, | Westport. |
| Bowers, William Cutler, | P. & S., N. Y., '77, | Bridgeport. |
| Bradley, Wm. Lockwood, B.A., '60, | Yale, '64, | New Haven. |
| Bradstreet, Edw'd Thos., B.A., '74, | P. & S., N. Y., '77, | Meriden. |
| Braman, Francis Nelson, | Bellevue, '66. | New London. |
| Brayton, Charles Erskine, | P. & S., N. Y., '73, | Stonington. |
| Brewer, Edward Pliny, Ph.D., | Dartmouth, '79, | Norwich. |
| Bromley, Daniel Tyler, | Yale, '67, | Hartford. |
| Brooks, Frank Terry, B A., Yale, | P. & S., '93, | Greenwich. |
| Brown, David Chester, | Yale, '84, | Danbury. |
| Brown Charles Henry, | Univ. N. Y., '93, | Waterbury. |
| Brown, Orlando, | Yale, '51, | Washington. |
| Brown, Richard Francis, | Yale, '92, | New Britain. |
| Browne, William Tyler, Ph.B., '78, | Harvard, '82, | Norwich. |
| Brownlee, Harris Fenton, | P. & S., N. Y., '88, | Danbury. |
| Brownson, William Greene, M.A., | Univ. N. Y., '65, | Noroton. |
| Buckley, Lawrence Stephen, | Dartmouth, '89, | Stamford. |
| Buel, John Laidlaw, | P. & S., N. Y., '88, | Litchfield. |
| Bull, John Norris, | P. & S., N. Y., '78, | Plainville. |
| Bull, Thomas Marcus, | P. & S., N. Y., '87, | Naugatuck. |
| Bunce, Henry Clinton, | Yale, '50, | Glastonbury. |
| Bunnell, Wilbur Pitkin, | Univ. N. Y., '84, | New Britain. |
| Bunnell, William Henry, | P. & S., N. Y., '79, | Bridgeport. |
| Burchard, William Metcalf, | Georgetown, '66, | Uncasville. |
| Burke, George Whitney, B.A., '91, | Yale, '43, | Middletown. |
| Burke, William Craige, | L. I. Col. Hosp., '75, | South Norwalk. |
| Burke, William Patrick John, | Yale, '90, | New Haven. |
| Burnap, Sidney Rogers, A.B., Union, '58, | P. & S., N. Y., '62, | Windsor Locks. |
| Burns, Edward, | Univ. N. Y., '82, | New Britain. |
| Burtch, Harry Mercein, | Albany, '82, | Salisbury. |
| Burwell, Jeremiah, | Berkshire, '39, | New Hartford. |
| Bush, Charles Ellsworth, | Yale, '94, | Cromwell. |
| Butler, Charles Voorhes, | Univ. N. Y., '93, | Norwich. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Cahill, Joseph Henry, | Balt Univ., '92. | Hartford. |
| Cahill, Thomas Matthew, | Yale, '88, | New Haven. |
| Calef, Jeremiah Francis, B.A., '77, | Yale, '80, | Middletown. |
| Camp, Charles Welford, | Univ. N. Y., '75, | Canaan. |
| Campbell, Arthur Joseph, | P. & S., Balt., '85, | Middletown. |
| Campbell, James, | Univ. Vt., '71, | Hartford. |
| Cannon, Frederick Miller, | Univ. N. Y., '67, | Waterbury. |
| Carmalt, William Henry, M.A., '81, | P & S., N. Y., '61, | New Haven. |
| Carrington, Charles, | P. & S., N. Y., '60, | Farmington. |
| Case, Ida R. Gridley B.A., Wes. Univ., '86; M.A., Wes., '88, | P. & S., Boston. '89, | Collinsville. |
| Cassidy, Patrick, | Univ. Vt., '65, | Norwich. |
| Castle, Frank Edwin, | Yale, '70, | Waterbury. |
| Chamberlain, Myron Newton, B.A., '57, | Yale, '66, | Cheshire. |
| Chapman, Albert Taylor, | P. & S, N. Y., '64, | Mystic. |
| Chapman, Sherman Hartwell, B.A., '53; M.A., '66, | P. & S., N. Y., '69, | New Haven. |
| Cheney, Benjamin Austin, B.A., '88, | Yale, '90, | New Haven. |
| Childs, Samuel Beresford, B.A., Yale, '83, | Univ. N. Y., '87, | Hartford. |
| Chipman, Edward Clifford, | P. & S., N. Y., '91, | Niantic. |
| Churchill, Asa Hopkins, | Yale, '57, | Meriden. |
| Clark, Arthur Norman, | P. & S., N. Y., '83, | South Norwalk. |
| Clark, Franklin Pierce, | P. & S., N. Y., '76, | Danbury. |
| Clark, Robert Moses, | Univ. Pa., '91, | New Britain. |
| Clary, George, A B., '52, | N. Y., '57; Yale, '57, | New Britain. |
| Clason, Abraham Travis, | Univ. N. Y., '66, | Danbury. |
| Cleaveland, Daniel Athearn, | Bowdoin, '56, | Middletown. |
| Coates, Franklin Avery, A.B., '72; A.M., '75, | P. & S., N. Y., '75, | Mystic Bridge. |
| Cogswell, William Badger, | Bellevue, '81, | Stratford. |
| Coholan, Michael James, | Univ. N. Y., '65, | New Britain. |
| Coleburn, Arthur Burr, | P & S., N. Y., '90. | Middletown. |
| Comings, Benjamin Newton, | Castleton, Vt., '45, | New Britain. |
| Conkey, Caroline Root, | W. Med., N. Y., '81, | Waterbury. |
| Converse, George Frederick, | Yale, '87, | New Haven. |
| Coogan, Joseph Albert, | Bellevue, '76, | Windsor Locks. |
| Cook, Ansel Granville, | P. & S., N. Y., '87, | Hartford. |
| Cooley, Myron Lynus, | Buffalo, '86, | Southbury. |
| Cooper, Louis Edward, Ph.B., '84, | Yale, '86, | Ansonia. |
| Cornwall, Edward Thomas, | P. & S , N. Y., '81, | Cheshire. |
| Coudert, Frank Edmonds, Ph.D., | Univ. N. Y., '90, | Wallingford. |
| Cowell, George B., | P. & S . N. Y., '88, | Bridgeport. |
| Crane, Augustin Averill, B.A., '85, | Yale, '87, | Waterbury. |
| Crary, David, | Yale, '69, | Hartford. |
| Cremin, Lawrence Michael, | Univ. N Y., '81, | New Britain. |
| Cremin, Michael Aloysius, | P. & S., N. Y., '72, | New Haven. |
| Cressy, Noah, Ph.D., | Berkshire '62, | Hartford. |
| Crighton, Andrew John, | P. & S., Balt., '91, | Willimantic. |
| Crofton, Joseph Richard, | P. & S., N. Y., '89, | New London. |
| Cronin, Joseph Francis, | P. & S., N. Y., '83, | New London |
| Crossfield, Frederick Solon, | Bellevue, '78, | Hartford. |
| Crothers, Thomas Davison, | Albany, '65, | Hartford. |
| Crowley, William Holmes, | Buf. Med. Col., '90, | Collinsville. |
| Curtiss, William Martin Stanley, | P. & S., Balt., '93, | Cornwall Bridge. |
| Daggett, David Lewis, B.A., '39, | Yale, '43. | New Haven. |
| Daggett, William Gibbons, B.A., '80, | Univ. Pa., '84, | New Haven. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Darby, Charles Sinclair, | Charl'st'n Med., '60, | Stamford. |
| Darby, Charles Sinclair, Jr., | Univ. N. Y., '90, | Stamford. |
| Darling, Asael Ebenezer, | Harvard, '72, | Killingly. |
| Dart, Frederick Howard, | P. & S., N. Y., '84, | Niantic. |
| David, Adélard David, | Dartmouth, '89, | Willimantic. |
| Davis, Charles Henry Stanley, | Univ. N. Y., '66, | Meriden. |
| Davis, Edwin Taylor, | Univ. Vt., '88, | Ellington. |
| Davis, Emory Hawkins, | Univ. Vt., '72, | Moosup |
| Davis, Gustav. Pierpont, B.A., '66, | P. & S., N. Y., '69, | Hartford. |
| Davis, Warren Russell, | Univ. Vt., '82, | Voluntown. |
| Davison, Luther Angustus, | Univ. N. Y., '82, | Hartford. |
| Day, Fessenden Lorenzo, B.A., | Bellevue, '93, | Bridgeport. |
| Day, Loren True, | Yale, '80. | Westport. |
| Dean, Henry Spalding, | Jefferson, '52, | South Coventry. |
| Dean, Horace Camillus, | Univ. N. Y., '85, | New Britain. |
| DeForest, Lonis Shepard, B.A., '79; M.A., '91, | Univ. Jena, '85, | New Haven. |
| Delaney, William Joseph, | McGill Univ., '87, | Naugatuck. |
| Delesdernier, Horace William, | Univ. Vt., '85, | Meriden. |
| DeWolfe, Daniel Charles, | Univ. Vt., '86, | Bridgeport. |
| Dibble, Frederick Levi, | Yale, '59, | New Haven. |
| Dickinson, Francis Lemuel, | Yale, '40, | Rockville. |
| Dimon, John Nicoll, | L. I. Coll. Hosp., '83, | New London. |
| Donahue, James Francis, | Univ. Vt., '92, | New Britain. |
| Donaldson, William Henry, | Univ. N. Y., '81, | Fairfield. |
| Dooley, John Thomas, | Univ. N. Y., '87, | Manchester. |
| Douglass, Edmond Peaslee, | Univ. N. Y., '89, | Groton. |
| Doutteil, Henry, | Yale, '79, | New Britain. |
| Dowling, John Francis, | L. I. Coll. Hosp., '90, | Thompsonville. |
| Down, Edwin Angustus, | P. & S., N. Y., '87, | Hartford. |
| Downey, Roger Charles, | Univ. Vt., '92, | Portland. |
| Downs, Frederick Bradley, | Univ. N. Y., '78, | Bridgeport. |
| Dunham, Martin Van Buren, | Harvard, '67, | Greenfield Hill. |
| Dwyer, John, | Univ. N. Y., '71, | Hartford. |
| Edgerton, Francis Daniels, A.M., '61, | Univ. Vt., '61; P. & S., N. Y., '64, | Middletown. |
| Eggleston, Jeremiah Dewey, | P. & S., N. Y., '79, | Meriden. |
| Elcock, Harry Alfred. | Yale, '91, | New Haven. |
| Eliot, Gustavus, B.A., '77; A.M., '82, | P. & S., N. Y., '80, | New Haven. |
| Ellis, Richard, | P. & S., N. Y., '88, | Danbury. |
| Ellsworth, Pinckney Webster, B.A., Yale, '36; M.A., Yale, '39, | P. & S., N. Y., '39, | Hartford. |
| Elmer, Oliver Edward, | P. & S, Balt., '94, | Hartford. |
| Enlind, Kannt Arvid, | P. & S., Balt., '93, | New Britain. |
| Ensign, Robert Eleazer, | Albany, '57, | Berlin. |
| Evans, Alexander William, Ph.B., '90, | Yale, '92, | New Haven. |
| Fenn, Ava Hamlin, | P. & S., Balt., '86, | Meriden. |
| Ferguson, George Dean, | Univ. N. Y., '79, | Thomaston. |
| Ferris, Anna Jackson, | Wom. Med., Pa,, '74, | Meriden. |
| Ferris, Harry Burr, B.A., '87, | Yale, '90, | New Haven. |
| Field, Albert, | L. I. Coll. Hosp., '67, | East Hampton. |
| Finch, George Terwilliger, B.A., M.A., '78, | Hobart, '75, Bellevue, '77, | Thompsonville. |
| Fisher, William Edwin, | Univ. Pa., 76, | Middletown. |
| Fiske, Isaac Parsons, | Univ. N. Y., '75, | Waterbury. |
| Fitzgerald, Edward, | P. & S., Balt., '84, | Bridgeport. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Fleischner, Henry, | Yale, '78, | New Haven. |
| Flint, Eli Percival, | Yale, '79, | Rockville. |
| Follansbee, Willard Francis, | P. & S., Chic., '86, | Danbury. |
| Foote, Charles Jenkins, B.A., '83, | Harvard, '87, | New Haven. |
| Ford, George Skiff, | Bellevue, '93, | Bridgeport. |
| Ford, William J., | Univ. N. Y., '84, | Washington. |
| Foster, John Pierpont Codrington, B.A., '69, | Yale, '75, | New Haven. |
| Foster, Warren Wooden, | Harvard, '82, | Putnam. |
| Fox, Charles Anson, | P. & S., N. Y., '81, | E. Hartford. |
| Fox, Charles James, | Univ. N. Y., '76, | Willimantic. |
| Fox, Edward Gager, | Univ. N. Y., '83, | Wethersfield. |
| Fox, Morton Earl, | L. I. Coll. Hosp., '93, | Montrose. |
| Fox, Roswell, | Univ. N. Y., '47, | Wethersfield. |
| Franklin, Spencer, | Univ. N. Y. '89, | Greenwich. |
| Franklin, Thomas Morris, | Univ. N. Y., '47, | Greenwich. |
| French, Eugene Cowles, | Univ. Mich., '82, | Watertown. |
| French, Wm. Freeman, B.A., M.A., | Univ. N. Y., '84, | Noroton. |
| Freney, John Daniel, | L. I. Coll. Hosp., '93 | Waterbury. |
| Froelich, Charles Edward, M.A., Univ. Copenhagen, '64, | Copenhagen, 70, | Hartford. |
| Frost, Charles Warren Selah, | P. & S., N. Y., '80, | Waterbury. |
| Fuller, Austin Brainard, B.A., Yale, '66, | Yale, '92, | New Haven. |
| Fuller, Horace Smith, Amherst, B.A., '58; A.M., '61, | P. & S., N. Y., '65, | Hartford. |
| Galvin, William, | Univ. Vt., '92, | Meriden. |
| Garlick, Samuel Middleton, B.A., Dart., '74, | Harvard, 77, | Bridgeport. |
| Gartland, John Lawrence, | Univ. N. Y., '91, | Meriden. |
| Gay, George Clifton, | Univ. Mich., '90, | Waterbury. |
| Gaylord, Chas. Woodward, B.A., '70, | Yale, '72, | Branford. |
| Gaynor, Louis Joseph, | Univ. N. Y., '91, | New Haven. |
| Geib, Henry Philip, | Bellevue, '69, | Stamford. |
| Gilbert, Samuel Dutton, B.A., '69, | Yale, '71, | New Haven |
| Gillin, Charles Adelbert, | Univ. N. Y., '83, | Berlin. |
| Gilnack, Frederick, | P. & S., N. Y., 67, | Rockville. |
| Girard, Charles Hermenegilde, | Vict., Montreal, '90, | Willimantic. |
| Gladwin, Ellen Hammond, | W. Med., N. Y., '72, | Hartford. |
| Godfrey, Charles Cartlidge, | Dartmouth, 83, | Bridgeport. |
| Goodenough, Edward Winchester, B.A., Yale, '87, | Yale, '93, | Waterbury. |
| Goodrich, Alfred Russell, | Berkshire, '46, | Vernon. |
| Goodwin, Ralph Schuyler, | P. & S., N. Y., '66, | Thomaston. |
| Goodyear, Robert Beardsley, | Yale, '68, | North Haven. |
| Gorham, Andrew Bennett, | Yale, '79, | Wilton. |
| Gorham, Frank, | Yale, '76, | Lyon's Plain. |
| Grannis, John Henry, | Yale, '68, | Old Saybrook. |
| Graves, Charles Burr, B.A., '82, | Harvard, '86, | New London. |
| Graves, Frederick Chauncey, | Univ. N. Y., '88, | Bridgeport. |
| Gray, William Henry, | P. & S., N. Y., '89, | Mystic. |
| Gregory, James Glynn, B.A., '65, | P. & S., N. Y., '68, | Norwalk. |
| Griggs, Edward Luther, | L. I. Coll. Hosp., '64, | Waterbury. |
| Griggs, Oliver Burnham, | Univ. N. Y., '47, | Willimantic. |
| Griswold, Edward Hammond, | Univ. N. Y., '78, | East Hartford. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Griswold, Frederick Pratt, | P. & S., N. Y., '76, | Meriden. |
| Griswold, Hamilton Byron, | Univ. Vt., '86, | Gaylordsville. |
| Griswold, Julius E., | Univ. N. Y., '78, | Portland. |
| Griswold, Roger Merwin, | Univ. N. Y., '75, | Derby. |
| Griswold, Rufus White, | P. & S., N. Y., '54, | Rocky Hill. |
| Griswold, Wm. Loomis, Ph.B., '81, | P. & S., N. Y., '85, | Greenwich. |
| Guild, Frank Eugene, | L. I. Coll Hosp., '85, | Windham. |
| Goldstein, Frederick Carl, | Yale, '93, | Ansonia. |
| Hall, Edward Dormenio, | Harvard, '73, | Meriden. |
| Hall, Joseph Barnard, | Yale, '92, | Hartford. |
| Hallock, Frank Kirkwood, A.B., A.M., '82. | P. & S., N. Y., '85, | Cromwell. |
| Hallock, Winthrop Bailey, | L. I. Col. Hosp., '64, | Cromwell. |
| Hamant, Irving Lewis, | L. I. Col. Hosp., '90, | Norfolk. |
| Hamilton, Charles Allen, | Univ. Vt., '86, | Waterbury. |
| Hammond, Henry Louis, Ph.B., '64, | Harvard, '66, | Killingly. |
| Hanchett, Thatcher Swift, | Bellevue, '64, | Torrington. |
| Harley, Mary, | Wom. Col. N. Y. Infirmary, '92, | Middletown. |
| Harriman, Patrick Henry, | Univ. N. Y., '84, | Norwich. |
| Harris, George Robert, | P. & S., N. Y., '85, | Norwich. |
| Hart, Charles Remington, | P. & S., N. Y., '59, | Bethel. |
| Haskell, Charles Nahum, | Univ. Vt., '90, | Bridgeport. |
| Hastings, Panet Marshall. A.B., '38; A.M., Hamilton, '81, | P. & S., N. Y., '42, | Hartford. |
| Haven, William Chadbourne, | Univ. N. Y., '77, | Coventry. |
| Hawkes, Wm. Whitney, B.A., '79, | Yale, '81, | New Haven. |
| Hawley, George Rufus. | L. I. Col. Hosp., '92, | Danbury. |
| Hayes, John Francis, | Univ. N. Y., '79. | Waterbury. |
| Hazen, Henry C., | P. & S., N. Y., '92, | Haddam. |
| Hazen, Miner Comstock, | Univ. Mich., '55, | Haddam. |
| Heady, Elias Buel, | Yale, '72, | Milford. |
| Heyer, Harold Hankinson, | Univ. N. Y., '87, | New London. |
| Hexamer, Carl Reisig, B.S., '83, | P. & S., N. Y., '86, | Stamford. |
| Hibbard, Nathaniel, A.B., '78, | Harvard, '82, | Danielsonville. |
| Higgins, Royal Lacey, | Bellevue, '67, | Norwalk. |
| Higgins, William Lincoln, | Univ. N. Y., '90, | South Coventry. |
| Hill, Charles Edwin, B.A., '76, | Harvard, '79, | East Killingly. |
| Hill, Edwin Allen, | Harvard, '50, | East Killingly. |
| Hill, Seth, | Yale, 66, | Stepney. |
| Hills, Thomas Morton, | Yale, '63, | Willimantic. |
| Holbrook, Lowell, | Univ. N. Y., '49, | Thompson. |
| Holmes, Arthur Almond, | Harvard, '65, | Bridgeport. |
| Holmes, George James, | Albany, '82, | New Britain. |
| Holmes, Walter Hamilton, A.B., '75, | Harvard, '79, | Waterbury. |
| Horton, William Wickham, | Univ. N. Y., '79, | Bristol. |
| Hotchkiss, Norton R., | Univ. Md., '91, | New Haven. |
| Hough, Henry Wightman, | Yale, '36, | Putnam. |
| Houghton, Simon Willard, | Bellevue, '79, | Hazardville. |
| Howard, Arthur Wayland, | Univ. N. Y., '90, | Wethersfield. |
| Howard, John. | Dartmouth, '81, | Hartford. |
| Howe, Harmon George, | Univ. Vt., '73; P. & S., N. Y., '75, | Hartford. |
| Hoyt, Curtis Clark, | P. & S., N. Y., '87, | Bridgeport. |
| Hubbard, Charles Henry, | Yale, '60, | Essex. |
| Hubbard, Robert, | Yale, '51, | Bridgeport. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Hubbard, Stephen Grosvenor, M.A., '60, | Dartmouth, '43, | New Haven. |
| Hudson, William Miller, B.A., Yale, '53, | Jefferson, '55, | Hartford. |
| Hughes, Oliver John Davis, | L. I. Col. Hosp., '75, | Meriden. |
| Hulbert, William Sharon, | Univ. N. Y., '89, | Winsted. |
| Huntington, Samuel Henry, | Yale, '76, | Norwalk. |
| Hurd, Alonzo L., B.S., Me., '82, | Univ. Vt., '91, | Somers. |
| Hurlbut, Augustus Moën, B.A., '76, | P. & S., N. Y., '79, | Stamford. |
| Husinsky, Moses Jacob, | Yale, '92, | New Haven. |
| Ingalls, Phineas Henry, A.B., '77; A.M., Bowdoin, '85, | P. & S., N. Y., '80, | Hartford. |
| Irving, Samuel Wellington, | Yale, '91, | New Britain. |
| Isham, Oliver Kingsley, | Univ. N. Y., '88, | Hartford. |
| Ives, Robert Shoemaker, B.A., '64; M.A., | Yale, '66, | New Haven. |
| Jarvis, George Cyprian, | Univ. N. Y., '60, | Hartford. |
| Jennings, George Herman, | L. I. Coll. Hosp., '75, | Jewett City. |
| Johnson, Edwin Hines, | Univ. Vt., '88, | Naugatuck. |
| Johnson, Frederick Eugene, | Univ. N. Y., '69, | Mansfield. |
| Johnson, John William, | P. & S., Balt., '93, | Thomaston. |
| Johnson, Marcus Morton, Ph.B., Brown, '70, | Univ. N. Y., '77, | Hartford. |
| Jones, Daniel Albion, B.A., Yale, '84; D.M.D., Harvard, '89, | Yale, '92, | New Haven. |
| Judson, Walter, B.A., '64; M.A., '67, | P. & S., N. Y., '70, | New Haven. |
| Judson, William Henry, | Jefferson, '78, | Danielsonville. |
| Kane, Thomas Francis, | Bellevue, '87, | Hartford. |
| Kean, Mrs. L. Darnstadt, | Wom. Med., Pa., '87, | Hartford. |
| Kendall, John Calvin, B.A., '70, | P. & S., N. Y., '75, | Norfolk. |
| Keniston, James Mortimer, | Harvard, '71, | Middletown. |
| Kent, John Bryden, | Harvard, '69, | Putnam. |
| Ketchum, Leander Young, | Univ. Vt., '80, | Woodbury. |
| Kimball, Rush Wilmot, A.B., '87, Williams, | L. I. Coll. Hosp., '90, | Norwich. |
| Kindred, John Joseph, | Lonisville Hosp. Med. Coll., '89, | Darien. |
| Klenke, Henry Frederick, | Univ. N. Y., '92, | New Haven. |
| Knight, George Henry, | P. & S., N. Y., '86, | Lakeville. |
| Knight, William Ward, | Univ. N. Y., '76, | Hartford. |
| Knight, William Wilshire, | Berkshire, '68, | Sharon. |
| Korn, William Alfred, | Yale, '92, | Norwich. |
| Lacey, William Frederick, | Yale, '44, | Danbury. |
| Lambert, Benjamin Lott, | Univ, N. Y., '83, | New Haven. |
| Lawson, George Newton, B.A., '90, | Yale, '92, | Middle Haddam. |
| Lawrence, George W., | Yale, '90, | Cromwell. |
| Lawton, Franklin Lyman, Ph.B., Yale, '90, | Yale, '93, | Hartford. |
| Lauder, Robert, M.A., | Yale, '71, | Bridgeport. |
| LaPierre, Julian, | Bellevue, '71, | Norwich. |
| LaRue, Omer, | Vict., Montreal, '71, | Putnam. |
| Lawlor, Timothy Chris. Ambrose, | Bellevue, '92, | Rockville. |
| Leavenworth, Daniel Carrol, | Yale, '65, | New Haven. |
| LeClair, Charles Joseph, | Victoria, '87, | Danielsonville. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Lee, Frank Herbert. | Albany, '88. | Canaan. |
| Leonard, Elbridge Knowlton. | Conn. Med. S'y., '66, | Rockville. |
| Lewis, George Francis, B.A., '64, | Yale, '65, | Collinsville. |
| Lewis, George Frederick, B.A., '77, | Yale, '84, | Stratford. |
| Lewis, John Benjamin, | Univ. N. Y.. '53, | Hartford. |
| Lindsley, Charles Augustus, B.A., '49; M.A., | Yale, '52, | New Haven. |
| Lindsley. Chas. Purdy, Ph.B., '75, | Yale, '78, | New Haven. |
| Livingston, Joseph Alexander, | L. I. Hosp., '90, | West Cornwall. |
| Look, Frank Byron, | Bowdoin, '84, | Middletown. |
| Loomis, Francis Newton, B.A., '81, | Yale, '83, | Birmingham. |
| Loveland, John E., A.B., '89, | Harvard, '92, | Middletown. |
| Lowe, Russell Walter, | Univ. N. Y., '89, | Ridgefield. |
| Luby, John Francis, Ph.B., '76, | P. & S., N. Y., '78, | New Haven. |
| Lynch, John Charles, | Univ. N. Y., '86, | Bridgeport. |
| Lyon, Edwin Bradbury, | Berkshire, '62, | New Britain. |
| Lyon, Irving Whitall, | Univ. Vt., '62, P. & S., N. Y., '63, | Hartford. |
| Lyons, Andrew Wolff, | Columbus, '76, | Bridgeport. |
| MacLaren, William Stevenson, | P. & S., N. Y., '89, | Litchfield. |
| Madden, Edward George, | Yale, '85, | New Haven. |
| Maher, Stephen John, | Yale, '87, | New Haven. |
| Mailhouse, Max, Ph.B., '76, | Yale, '78, | New Haven. |
| Mansfield, Howard Parker, | L. I. Coll. Hosp., '93, | Georgetown. |
| Marcy, Robert Adrian, | Univ. N. Y., '82, | New Preston. |
| Marlles, Hubert Walter, | Lonisville Med. Coll., '93, | Hartford. |
| Marsh, Arthur Washburn, | Univ. Vt., '82, | Westville. |
| Martin, Thomas Francis, | Univ. N. Y., '74, | Bridgeport. |
| Mason, Jarvis King, Yale, B.A., '55; M.A., '59, | Harvard, '61, | Suffield. |
| Mathewson, Earl, | P. & S., N. Y., '79, | Durham. |
| May, Austin Ela, | Univ. Vt., '79, | Bridgeport. |
| May. Jacob, | Rush, Chicago, '76, | Bridgeport. |
| Mayherry, Franklin Hayden, | Univ. Vt., '85, | Burnside. |
| Mayer, Nathan, | Cincinnati, '57, | Hartford. |
| McCabe, Edward Michael, B.A., '84, | Yale, '87, | New Haven. |
| McDonald, Edward Walsh, | Univ. N. Y., '71, | Waterbury. |
| McDonnell, Ralph Augustine, B.A., '90, | Yale, '92, | New Haven. |
| McGaughey, James David, | Jefferson, '70. | Wallingford. |
| McIntosh, James Fabien, | Victoria, '87, | N. Grosven'r'le. |
| McKnight, Everett James, B.A., Yale, '76, | P. & S., N. Y., '79, | Hartford. |
| McNair, Robert Hamilton, | Jefferson, '90, | New Haven. |
| McNeil, Rollin, | Yale, '62, | New Haven. |
| Mead, Kate Camphell, | Wom. Med. Coll., Phila., '88, | Middletown. |
| Meek, James Albert, | McGill Univ., '75, | Stamford. |
| Meeks, Edwin Joseph, | Bellevue, '90, | Stamford. |
| Meeks, Harold Albert, | Bellevne, '90, | Meriden. |
| Miles, Harry Shillingford, Ph.G., N. Y., '88, | P. & S., N. Y., '91, | Bridgeport. |
| Miller, George Root, | P. & S., Balt., '88, | Hartford. |
| Minor, George Maynard, | L. I. Coll. Hosp., '85, | Waterford. |
| Moody, Mary Blair, | Buffalo, '76, | New Haven. |
| Moore, James Albert, B.A., Yale, '92, | Yale, '94, | New Haven. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Morgan, William Dennison, A.B., Trinity, '72, | P. & S., N. Y., '76, | Hartford. |
| Morrell, Frederick Augustus, | L. I. Coll. Hosp., '85, | Putnam. |
| Morrissey, John Joseph A.B., '81; A.M., '93. | Univ. N. Y., '84, | Hartford. |
| Munger, Carl Eugene. Ph.B., '80. | P. & S., N. Y., '83, | Waterbury. |
| Munger, Elisha, | Yale, '75. | New London. |
| Munger, Walter Seward. | Yale, '55. | Watertown. |
| Munson, Byron Wooster, | Yale, '69, | Sharon. |
| Murphy, Michael Daniel, | Bellevue, '84. | Middletown. |
| Murphy, Walter Graham. | Alb'y Med. Coll., '90. | Granby. |
| Nelson, Abiel Ward, | Harvard, '61. | New London. |
| Newton, Cyrus Brownlie, | Yale, '56. | Stafford Springs. |
| Newton, Matthew Turner, | Yale, '51. | Suffield. |
| Nichols, Edward Payson. A.B., '48; A.M., '51, | P. & S., N. Y., '52. | Killingworth. |
| Nickerson, Nehemiah, | N. Y. Med. Coll., '57. | Meriden. |
| Nicoll, John, | Yale, '54, | New Haven. |
| Noble, Henry Smith, A.B., '59, | P. & S., N. Y., '71, | Middletown. |
| North, James Howard, | L. I. Coll. Hosp., '73, | Goshen. |
| Noyes, Selden Walkley, | Univ. Pa., '68, | Haddam. |
| Ober, George Eugene, | Univ. Vt., '90, | Bridgeport. |
| O'Connell, Thomas James, | P. & S., Balt., '92. | East Hartford. |
| O'Connor, Matthew Chas., A.B., '69, | P. & S., N. Y., '73, | New Haven. |
| O'Connor, Patrick Thomas, | Bellevue, '92. | Waterbury. |
| O'Flaherty, John, | Albany, '64, | Hartford. |
| O'Hara, Bernard Augustine, | Bellevue, '82, | Waterbury. |
| Olmstead, James, B.A., '72, | Yale, '74. | Middletown. |
| Osborn, George Wakeman, B.A., '83, | P. & S., N. Y., '87, | Bridgeport. |
| Osborne, Curtis Hinman, | Yale, '77, | Southport. |
| Osborne, Oliver Thomas, | Yale, '84, | New Haven. |
| O'Sullivan, Thomas Jefferson, | Bellevue, '76, | Birmingham. |
| Overlock, Selden Barden, | Bellevue, '89, | Pomfret. |
| Paddock, Lewis Sloat, M.A., | N. Y. Med. Coll., '54. | Norwich. |
| Park, Charles Edwin, | Yale, '81, | New Haven. |
| Parker, Julian Newell. | Yale, '67, | S. Manchester. |
| Parker, Theodore Raymond. | Univ. N. Y., '80, | Willimantic. |
| Parmele, George Luther, D.M.D., | L. I. Coll. Hosp., '69, | Hartford. |
| Parsons, Edward Field, A.B., Williams, '48, | P. & S., N. Y., '58, | Thompsonville. |
| Peck, Anthony, B.A., '72, | Univ. N. Y., '75, | Norwich. |
| Peck, George Augustus, | P. & S., N. Y., '91, | Meriden. |
| Peck, Robert Ellsworth, Ph.B., Yale, '90, | Yale, '93, | New Haven. |
| Peckham, Lucy Creemer, | Wom. Med., Pa., '85. | New Haven. |
| Perkins, Charles Harris, | P. & S., N. Y., '91, | Norwich. |
| Perkins, William Sheldon Clark, | P. & S., N. Y., '60, | Norwich. |
| Philip, Rosavelle Gardner, | (Wom. Med. Coll., (N. Y. Inf., '75, | Stamford. |
| Phillips, Alfred Noroton, | P. & S., N. Y., '83, | Stamford. |
| Phinney, Elisha, | Yale, '35, | Yantic. |
| Pierce, Elbridge Worthington, | Univ. N. Y., '85. | Meriden. |
| Pierson, Samuel, | P. & S., N. Y., '81, | Stamford. |
| Pinney, Royal Watson, | P. & S., N. Y., '88, | Derby. |
| Pirritte, Frederick Winchelle, | Univ. Toronto, '93. | Norwich. |
| Pitman, Edwin Parker, B.A., '86, | Dartmouth, '91, | New Haven. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Platt, William Logan, | P. & S., N. Y., '81, | Torrington. |
| Plumstead, Matthew Woodbury, | Jefferson, '87, | East Haddam. |
| Plunkett, Henry Bernard, | Univ. N. Y., '91, | Rocky Hill. |
| Porter, George Loring, B.A., '59, | Jefferson, '62, | Bridgeport. |
| Porter, Isaac Napoleon, B.A., Lincoln Univ., '90, | Yale '93, | New Haven. |
| Porter, William, Jr., | Chic. Med. Coll., '81, | Hartford. |
| Potter, Frank Edward, | P. & S., N. Y., '89, | Portland. |
| Powers, Frederick, | P. & S., N. Y., '70, | Westport. |
| Poyer, John Baptist, | Dartmouth, '86, | New Britain. |
| Pratt, Edward Loomis, | Univ. N. Y., '84, | Winsted. |
| Pratt, Elias, | P. & S., N. Y., '87, | Torrington. |
| Purdy, Alexander Marshall, | Univ. Vt., '84, | Mystic Bridge. |
| Rainville, Frederick Edmund, | Univ. Vt., '91, | Wauregan. |
| Rafftery, Thomas Harry, B.A., '76, M.A., Holy Cross, '86, | Worcester, '86, P. & S., N. Y., '86, | Stafford Springs. |
| Randall, William Sherman, Ph.B., | Yale, '83, | Shelton. |
| Rankin, Chas. Goodrich, A.M., '87, Williams, A.B. '84, | Chic. Med. Coll., '86, | Glastonbury. |
| Reilly, James Michael, | Yale, '78, | New Haven. |
| Reynolds, Herbert Sumner, | Univ. N. Y., '81, | Clinton. |
| Rice, Frederic Augustus, | Bellevue, '76, | Bridgeport. |
| Rice, Watson Emmons, | Univ. Mich., '72, | Stamford. |
| Richardson, Dana Putnam, | Harvard, '82, | Sandy Hook. |
| Richardson, Dwight Alphonso, | Yale, '81, | Shelton. |
| Ring, Henry Wilson, A.B., '79; M.A., | Me. Med. Coll , '81, | New Haven. |
| Rising, Henry Martin, | Yale, '68, | S. Glastonbury. |
| Robbins, George Orrin, | Yale, '79, | Waterbury. |
| Robbins, James Watson, | Bellevue, '80, | Naugatuck. |
| Roberts, Edw. Kilbourne, Ph.B., '78, | Yale, '80, | New Haven. |
| Robinson, Myron Winslow, | Berkshire, '60, | Colchester. |
| Robinson, Paul Skiff, Ph.B., Yale, '89, | Yale, '91, | New Haven. |
| Robinson, Rienzi, | L. I. Coll. Hosp., '69, | Danielsonville. |
| Rockwell, Thomas Francis, | Univ. N. Y., '81, | Rockville. |
| Rodger, David Robert, A.B., Hamilton, '82, | P. & S., N. Y., '88, | Woodbury. |
| Rodman, Charles Shepard, | P. & S., N. Y., '68, | Waterbury. |
| Rogers, Charles Henry, B.A., '44, | Yale, '47, | Central Village. |
| Rogers, Francis Joseph, | Univ. Pa., '73, | Stamford. |
| Rogers, Frederick, | Univ. N. Y., '63, | Willimantic. |
| Root, Edward King, | Univ. N. Y., '79, | Hartford. |
| Root, Joseph Edward, B.S., '76, S.B., Boston Univ., | P. & S., N. Y., '83, | Hartford. |
| Rose, John Henry, | Univ. N. Y., '92, | Hartford. |
| Ruickoldt, Arthur, | Univ. Jena, '65, | New Haven. |
| Ruland, Fred Davis, | P. & S., N. Y., '89, | Westport. |
| Russell, Gurdon Wadsworth, Trinity, B.A., '34; M.A., '37, | Yale, '37, | Hartford. |
| Russell, Thomas Hubbard, Ph.B., Yale, '72, | Yale, '75, | New Haven. |
| Russell, William Spencer, | Yale, '80, | Wallingford. |
| Russell, Willis Adams, | Univ. N. Y., '81, | Essex. |
| Sanford, George Willis, | Berkshire, '36, | Simsbury. |
| Sanford, Leonard Jacob, M.A., '58, | Jefferson, '54, | New Haven. |
| Sawtelle, Frederic George, | L. I. Coll. Hosp., '80, | Pomfret. |
| Schavoir, Frederic, | P. & S., Balt., '87, | Stamford. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Scott, Albert Lewis, | P. & S., N. Y., '85, | Danbury. |
| Sears, Cushman Allen, | Univ. N. Y., '62, | Portland. |
| Seaver, Jay Webber, B.A., '80, | Yale, '85, | New Haven |
| Sedgwick, James Theodore, | Univ. N. Y., '85, | Litchfield. |
| Segur, Gideon Cross, | P. & S., N. Y., '82, | Hartford. |
| Selleck, Nathaniel, | Univ. N. Y., '89, | Danbury |
| Sellew, Philip Hamilton, | Jefferson, '90, | Warehouse P'nt. |
| Sheedy, Bryan DeForest, | Univ. N. Y., '84, | Bridgeport. |
| Shelton, Gould Abijah, M.A., '91, | Yale, '69, | Shelton. |
| Shepard, Durell, | Yale, '64, | West Haven. |
| Shepherd, George Reubens, | Yale, '66, | Hartford. |
| Sherman, Henry Arthur, | Jefferson, '88, | Putnam. |
| Sherrill, George, | P. & S., '91, | Stamford. |
| Simmons, Willard Nelson, | Univ. Vt., '89, | Tolland. |
| Simpson, Frederick Thomas, B.A., Yale, '79, | Me. Med. Coll., '84, | Hartford. |
| Skinner, Clarence Edward, | Yale, '91, | New Haven. |
| Smith, Andrew Jackson, | P. & S., N. Y., '63, | Bridgeport. |
| Smith, Edward Everett, | L. I. Coll. Hosp., '71, | South Wilton. |
| Smith, Edward Montrose, | P. & S., N. Y., '82, | Newtown. |
| Smith, Edward Wier, A.B., Yale, '78, | McGill, Mont., '82, | Meriden. |
| Smith, Frank Llewellyn, | Albany, '83, | Bridgeport. |
| Smith, Frank Lewis, | Univ. N. Y., '75, | Stafford Springs. |
| Smith, Frederick Sumner, B.A., Yale, '79, | Yale, '82, | Chester. |
| Smith, Herbert Eugene, Ph.B., Yale, '79, | Univ. Pa., '82. | New Haven. |
| Smith, James Jay, | P. & S., Balt., '88, | Willimantic. |
| Smith, Junius Foster, | L. I. Coll. Hosp., '90, | Brookfield. |
| Smith, Marvin, | Univ. N. Y., '83, | New Haven. |
| Smith, Newton Phineas, | P. & S., N. Y., '82, | Norwich. |
| Smith, Oliver Cotton, | L. I. Coll. Hosp., '83. | Hartford. |
| Snow, Emerson Emory, | Jefferson, '74, | Danbury. |
| Spring, Frederick, | Univ. N. Y., '85, | Naugatuck. |
| Stanley, Charles Everett. | Univ. Pa., '76, | Middletown. |
| Stanton, George Dallas, | Bellevue, '65, | Stonington. |
| Stanton, John Gilman, B.A., Amherst, '70, | Würzburg, '73, | New London. |
| Steadman, Willard George, | Bellevue, '74, | Southington. |
| Stearns, Henry Putnam, B.A., Yale, '53; M.A., '56, | Yale, '55, | Hartford |
| Stern, Charles Seymour, | Bellevue, '91, | Hartford. |
| Stetson, James Ebenezer, | Yale, '81, | New Haven. |
| Stevens, John Gale, | Yale, '84, | Monroe. |
| St. John, Samuel Benedict, B.A., Yale, '66, | P. & S., N. Y., '75, | Hartford. |
| Stone, Jay Stephen, | P. & S., N. Y., '65. | New Britain. |
| Storrs, Melancthon, B.A., Yale, '52, | Yale, '53, | Hartford. |
| Stowe, William Harvey, | Yale, '88, | New Haven. |
| Strapp, Patrick Francis, | Bellevue, '92, | Seymour. |
| Stratton, Edward Augustus, | Univ. N. Y., '83, | Danbury. |
| Street, Philo William, | Univ. Vt., '92, | Suffield. |
| Strickland, Rial, | Albany, '39, | Thompsonville. |
| Sullivan, Daniel Francis, A.B., Niagara Univ., '89, | Niagara Univ., '91, | Hartford. |
| Sumner, Charles Fletcher. | Univ. W. N. Y., '40. | Bolton. |
| Swain, Henry Lawrence, | Yale, '84, | New Haven. |
| Swasey, Erastus Perry, | P. & S., N. Y., '69, | New Britain. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| Sweht, Josiah, | Univ Vt., '78, | New Hartford. |
| Swett, William Plummer, | Univ. Vt., '76, | Terryville. |
| Swift, Elisha Dean, | Univ. N. Y., '49, | Hamden. |
| Taft, Charles Ezra. | Harvard, '86, | Hartford. |
| Tanner, Alfred Herbert, | Bellevue, 74, | Brooklyn. |
| Taylor, John Clifton, | Mich. Univ , '91, | Scotland. |
| Tenney, Arthur John, Ph.B., Yale, '77, | Yale, '83, | Branford. |
| Thompson, George, | Me. Med. Coll., '89, | Taftville. |
| Thomson, Edward Sanford, | P. & S., N. Y., '92, | New Haven. |
| Thomson, Hiram Benson, | Trin. Un., Tor., '88, | New London. |
| Tingley, Witter Kinney, | Bellevue, '86, | Norwich. |
| Tinker, William Richard, | Univ. N. Y., '80, | S. Manchester. |
| Topping, Jacob Reed, | Univ. N. Y., '82, | Bridgeport. |
| Townsend, Jos. Hendley, B.A., Yale, '85, | Yale, '87, | New Haven. |
| Tracy, Andrew William, | McGill, Mont., '73, | Meriden. |
| Tracey, William Joseph, | Univ. N. Y., '89, | Norwalk. |
| Treadway, William A. Buckingham, | Univ. Mich., '83, | Stamford. |
| Treadwell, Oliver Ferd., B.A., Yale, '62, | Yale, '65, | Hamden. |
| Tudor, Mary Starr, | (Womens' Med. Col. (Phila. '93, | South Windsor. |
| Turner, Sylvester Wooster, B.A., Yale, '42, | Yale, '46, | Chester. |
| Tuttle, Charles Alling, Ph.B., Yale, '88, | Yale, '91, | New Haven. |
| Tuttle, Frank Benjamin. | Yale, '63, | Naugatuck. |
| Van Vleet, Peter P., | Bellevue, '69, | Stamford. |
| Varno, Arthur Joel, | P. & S., Balt., '92, | Branford. |
| Varno, Henry G., | P. & S., Balt , '82. | Thompsonville. |
| Voorhes, Charles DeWitt, | Univ. N. Y., '89, | Groton. |
| Waite, Frank Louis, | Bellevue, '88, | Hartford. |
| Walsh, Frederick William, | P. & S., Balt., '84, | Rockville. |
| Warner, Abner Spicer, A.B., Dartmouth, '42, | Dartmouth, '48, | Wethersfield. |
| Washburn, Nathaniel P., Ph.B., Yale. '71. | Univ. N. Y., '91, | Stamford. |
| Waters, John Bradford. | Univ. Vt., '90, | Hartford. |
| Weir, Janet Marshall, | (Queen's Univ. Kingston, Ontario, '91, | Hartford. |
| Watson, Wilbur Seymour, | L. I. Col. Hosp., '87, | Danbury. |
| Webb, Daniel Meigs, B.A., Yale, '46, | Yale, '49, | Madison. |
| Welch, Edward Hubbard, | Yale, '76, | West Winsted. |
| Welch, George Kellogg. | P. & S., N. Y., '78, | Hartford. |
| Welch, William Collins, | Yale, '77, | New Haven. |
| Weldon, John, | Univ. N. Y., '83, | Willimantic. |
| Weldon, Thomas Henry, | Univ. N. Y., '83, | S. Manchester. |
| Wellington, William Winthrop, | Univ. Vt., '89, | Terryville. |
| Wheeler, Franklin, B.A. Yale, '47; M.A., Yale, '67, | P. & S., N. Y., '52, | Farmington. |
| Wheeler, Frank Henry, B.A., Yale, '80, | Yale, '82, | New Haven. |

| Name. | Medical Graduation. | P. O. Address. |
|---|---|---|
| White, Benjamin Walker, | L. I. Col. Hosp., '86, | Bridgeport. |
| White, Frederick Olin, | Yale, '73, | New Haven. |
| White, Moses Clark, B.A., Wesleyan, '45, M.A., Yale, | Yale, '54, | New Haven. |
| White, Robert Creighton, | Univ. Vt., '89, | Willimantic. |
| Whiton, Francis Henry, | Dartmouth, '72. | Manchester. |
| Whittemore, Frank Hamilton, | Bellevue, '74, | New Haven. |
| Wiggin, Frederick Holme, | Bellevue, '77, | Litchfield. |
| Wile, William Conrad, M.A., | Univ. N. Y., '70, | Danbury. |
| Williams, Amos Loomis, | Jefferson, '41, | Brookfield. |
| Wilson, Frederick Morse, A.B., Colby, '71, | Harvard, '75, | Bridgeport. |
| Wilson, John Joseph, | P. & S., Balt., '86, | Bristol. |
| Wilson, Samuel Allen, | Yale, '52, | Windsor. |
| Wilson, William Patrick, | P. & S., Balt., '90, | Wallingford. |
| Wilson, William Virgil, | Yale, '67, | West Haven. |
| Winchell, Alverd Ezra, A.B., Wesleyan, '57, | P. & S., N. Y., '65, | New Haven. |
| Witter, William, | Yale, '65, | Norwich. |
| Wolff, Arthur Jacob, | (Tex. Med. Col. '76, Bellevue, '83. | Hartford. |
| Wood, William Francis, | P. & S., Balt., '93, | Danbury. |
| Woods, George Lyman, | Bowdoin, Me., '79, | Collinsville. |
| Wooster, Charles Morris, | Univ. N. Y., '79. | Tariffville. |
| Wordin, Nathaniel Eugene, B.A., Yale, '70; Yale, M.A., '72, | Jefferson, '73, | Bridgeport. |
| Worthington, Albert Brownell, | Yale, '47. | M'dle Haddam. |
| Wright, Frank Walden | Bellevue, '80, | New Haven. |
| Wright, John Winthrop, A.B., Amherst, '77. | Univ. N. Y., '80, | Bridgeport. |
| Wright, Theodore Goodelle, | Univ. N. Y., '65, | Plainville. |
| Wurtemberg, William Charles, Ph.B., Yale, '89, | Yale, '93. | New Haven. |
| Zink, Walter, | Würtzburg. | Branford. |

Members noticing any errors or omissions in any part of their record will please inform the Secretary for correction in future lists.

# DEPARTMENT OF MEDICINE,

## (YALE MEDICAL SCHOOL.)

### FACULTY.

Rev. Timothy Dwight, D.D., LL.D., President.
Moses C. White, M.D., *Professor of Pathology.*
Charles A. Lindsley, M.D., *Professor of the Theory and Practice of Medicine.*
William H. Carmalt, M.D., *Professor of Surgery.*
James Campbell, M.D., *Professor of Obstetrics and Diseases of Women and Children.*
Thomas H. Russell, M.D., *Professor of Clinical Surgery and Surgical Anatomy.*
Herbert E. Smith, M.D., *Professor of Chemistry, and Dean.*
Oliver T. Osborne, M.D., *Professor of Materia Medica and Therapeutics*
Harry B. Ferris, M.D., *Professor of Anatomy.*
Graham Lusk, Ph.D., *Professor of Physiology.*
Louis S. DeForest, M.D., *Professor of Clinical Medicine.*
Henry L. Swain, M.D., *Professor of Clinical Laryngology and Otology.*
B. Austin Cheney, M.D., *Assistant Professor of Obstetrics and Diseases of Women and Children.*

### OTHER INSTRUCTORS.

Professor William H. Brewer, Ph.D., *Lecturer on Sanitary Science and Public Health.*
Henry P. Stearns, M.D., *Lecturer on Insanity.*
Samuel B. St. John, M.D., *Lecturer on Ophthalmology.*
Henry Fleischner, M.D., *Lecturer on Dermatology and Clinical Medicine.*
Frank H. Wheeler, M.D., *Assistant in Pathology.*
Arthur N. Alling, M.D., *Instructor in Ophthalmology.*
Louis B. Bishop, M.D., *Assistant in the Surgical Clinic.*
Charles A. Tuttle, M.D., *Lecturer on Orthopaedic Surgery.*
Leonard W. Bacon, Jr., M.D., *Assistant in the Surgical Clinic.*
Warren A. Spalding, *Demonstrator of Pharmacy.*
Paul S. Robinson, M.D., *Assistant in the Medical Clinic.*
Ralph A. McDonnell, M.D., *Clinical Assistant in Dermatology.*
Robert E. Peck, M.D., *Assistant in the Medical Clinic.*
Charles J. Bartlett, M.D., *Assistant in Pathology.*
William H. Parker, B.S., *Assistant in Chemistry.*

## THE CURRICULUM.

The college year begins on the first Thursday of October, and extends until the last Wednesday in June, and includes 34 weeks, exclusive of vacations. Beginning with the Session of 1896–7, four years will be required to complete the course. The curriculum is graded and consists largely of exercises based on assigned lessons in text-books, with much *personal instruction* in laboratories and clinics.

*The Laboratories* in all departments are new, and fully equipped for thorough and systematic work by the students.

*The Clinical Instruction* is conducted at the New Haven Dispensary, located on the University grounds, and at the New Haven Hospital, which is near the School. Besides attending the regular clinics which are assigned in the schedule, the students serve as assistants in the Dispensary during the Senior year, and here participate in the daily work of a service amounting to about 11,000 cases annually.

## COLLATERAL INSTRUCTION.

In addition to the regular studies of the curriculum, medical students here have the unusual opportunities of increasing their fund of general information which arise from their residence in a great educational center. As members of the University there are open to them numerous lectures on scientific and other subjects, the scientific collections, and the free use of the University Library, 175,000 volumes.

## TERMS OF ADMISSION.

Candidates for admission to the course leading to the degree of Doctor of Medicine, must be at least eighteen years old, and must present satisfactory testimonials of moral character from former instructors or physicians in good standing.

As evidence that he has had a sufficient preliminary education, each candidate must present proof that he has passed the matriculation examination of some scientific, literary, or professional college in good standing; or present testimonials from the proper officer that he has pursued the course of some high school, academy, or preparatory school, approved by the Faculty; or he must pass an examination.

## PRIZES.

The Campbell Gold Medal is awarded to that member of the graduating class who has maintained the highest rank in the examinations of the course.

The Keese Prize of $140 is awarded annually to that member of the graduating class who presents the best thesis.

## GRADUATE INSTRUCTION.

The instruction here offered to graduates in medicine is intended to meet the requirements of two classes of students: first, those who wish to revise or supplement their knowledge of the regular studies of the medical curriculum as taught in this school, and second, those who wish to fit themselves in special lines of medical work, as for the duties of a medical examiner, or for medicolegal and sanitary examinations.

For particulars of the matriculation and degree examinations, and for information concerning tuition and living expenses, see the annual announcement, which will be furnished on application to the Dean. DR. HERBERT E. SMITH,

YALE MEDICAL SCHOOL,
NEW HAVEN, CONN.