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OF THE

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MEDICAL ASSOCIATION.

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Sam. A. Green, M.D.

(A.C. 1851.)

By a Resolution passed at the Session of 1851, the Committee of Publication were instructed to print conspicuously, at the beginning of the volume of the *Transactions*, the following disclaimer:—

"The American Medical Association, although formally accepting and publishing the Reports of the various Standing Committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution."

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MINUTES

OF THE

NINTH ANNUAL MEETING

OF THE

AMERICAN MEDICAL ASSOCIATION,

HELD IN THE CITY OF DETROIT, MICHIGAN, MAY, 1856.

DETROIT, *May* 6, 1856.

THE Association met at 11 o'clock A. M., in the "Firemen's Hall;" the President, Dr. GEO. B. WOOD, of Pennsylvania, in the chair, Dr. DANIEL TILDEN, of Ohio, one of the Vice Presidents, on his right.

Dr. WM. BRODIE, of Detroit, Michigan, one of the Secretaries, present.

The meeting being duly organized, the business first in order was stated by the Chair to be the reception of the Report of the Committee of Arrangements.

Dr. Z. PITCHER, Chairman of the Committee of Arrangements, in behalf of the Medical Profession of the city of Detroit, and of the State of Michigan, extended a cordial and hearty welcome to the members of the Association.

The roll of delegates was then called, as far as it could be made out, when delegates were found to be present from nineteen States, Min. Ter. and the U. S. Army.

The number of delegates who had registered their names was 208.

The following list comprises the names of all the delegates, permanent members, and members by invitation, in attendance at one period or other, during the meeting of the Association.

MAINE.

Maine Medical Association,	A. J. Fuller, G. S. Palmer, N. R. Boutelle, Hollis Monroe, N. P. Monroe, Wm. H. Allen, Chas. E. Swan, Asa McAllister.

NEW HAMPSHIRE.

State Medical Society,	Luke Miller, Hosea Pierce.
Centre District Med. Society,	Thos. H. Currie.

VERMONT.

Addison Co. Medical Society,	Chas. S. Allen.
Grafton District Med. Society,	H. H. Niles, Henry B. Brown.

MASSACHUSETTS.

Massachusetts State Med. Society,	Theodore Kittredge, Edw. T. Eastman, John Green, Horace W. Adams, James Thompson, Wm. D. Lamb, Nelson Carpenter, Jefferson Pratt, W. W. Comstock, Erasmus D. Miller, M. Bloomfield Leonard.
Worcester District Med. Society,	Oramel Martin, Henry Sargent.
Berkshire Medical College,	H. H. Childs.
Boston Lying-In Hospital,	Horatio R. Storer.
Franklin County Med. Society,	Ashman H. Taylor.
Berkshire Dist. of Mass. Med. Ass.,	John P. Perkins.
Permanent Member,	Eph. Lovel.

RHODE ISLAND.

State Medical Society,	J. E. WARREN.

CONNECTICUT.

State Medical Society,	N. B. IVES, P. G. ROCKWILL.
New Haven County Med. Society,	B. H. CATLIN, SHELDON BEARDSLEY, C. A. LINDSLEY.
Litchfield County Med. Assoc.,	WM. WOODRUFF, B. B. NORTH, RALPH DEMING.
Middlesex County Med. Society,	DAVID HARRISON,
New London County Med. Society,	D. P. FRANCIS.
Norwich Medical Association,	JOHN D. FORD.
Med. Institution of Yale College,	CHAS. HOOKER.

NEW YORK.

State Medical Society,	THOS. W. BLATCHFORD, C. B. COVENTRY.
Academy of Medicine,	J. W. GREEN, J. HANCOCK DOUGLAS, J. MCNULTY, J. M. MINOR, N. C. HUSTED.
New York County Med. Society,	WM. ROCKWELL, J. R. VAN KLIECK.
Genesee County Med. Society,	S. BARRETT, L. B. COTES.
Queen's County Med. Society,	JOHN D. SHELTON.
New York Medical College,	HORACE GREEN.
Med. Depart. University of N. Y.,	A. C. POST.
Bellevue Hospital,	JAMES R. WOOD.
New York Hospital,	JNO. WATSON.
Eastern Dispensary, City of N. Y.,	ISADOR GLÜCK.
Med. Chirurg. Soc. German Phy.,	G. I. E. WEBER.
Montgomery County Med. Society,	U. POTTER.
Oneida County Medical Society,	J. V. COBB, H. H. POPE, D. P. BISSELL.

King's County Hospital,	Thos. Turner, J. M. Ingraham.
Rochester Medical Society,	W. H. Briggs, L. McKay.
Geneva Medical College,	J. H. Jerome.
Kappa Lambda Society.	Jas. L. Phelps.
Brooklyn City Hospital,	D. C. Enos.
Erie County Medical Society,	Jas. M. Newman.
Society Statistical Med.,	J. A. Brady.
Orange County Med. Society,	A. H. Thompson.
Madison County Med. Society,	J. K. Chamberlayne.
Southern Central Association,	E. Daniels, S. West, Chas. H. Swaine.
Wayne County Med. Society,	Chas. E. Pomeroy.
Monroe County Med. Society,	W. W. Ely.
Washington County Med. Society,	P. V. N. Morris.
Richmond County Med. Society,	W. E. Anderson.
New York Statistical Society,	Thos. W. Brinsmade.
Permanent Members,	J. A. Morrell, Harvey Jewett.
By Invitation,	W. H. Reynall, R. K. Rodgers, Alex. Thomson.

PENNSYLVANIA.

State Medical Society,	J. M. Gemmill, H. Orlady, Adam Sheller.
College of Physicians,	Geo. B. Wood.
Philadelphia County Med. Society,	Anthony E. Stocker, Caspar Wister.
Med. Depart. Penna. College,	John Neill.
Lancaster City and Co. Med. Soc.,	John Ream, J. K. Raub, P. Cassidy, F. Hinkle, Henry Carpenter.
Lancaster County Hospital,	John L. Atlee.
Berks County Med. Society,	F. Rieser.

Huntingdon County Med. Society,	JOHN MCCULLOCH, J. B. LUDEN.
Bucks County Medical Society,	O. P. JAMES.
Med. Depart. University of Penna.,	JOSEPH LEIDY.
Beaver County Med. Society,	DAVID STANTON.
Med. Society City of Reading,	P. G. BERTOLET, WM. HERBST.
Philadelphia Hospital,	ROBT. K. SMITH.

NEW JERSEY.

Medical Society,	L. A. SMITH, J. BLANE, LEWIS CONDICT.
Somerset County Med. Society,	S. K. MARTIN.
Essex District Medical Society,	WM. PIERSON, Jr.

DELAWARE.

Wilmington Medical Association,	JAS. W. THOMSON.

MARYLAND.

Med. and Chirurgical Faculty,	P. WROTH.

SOUTH CAROLINA.

Medical Association,	B. W. BRADLEY, W. T. WRAGG, J. S. MITCHELL, R. S. BAILEY.
Med. College of the State of S. C.,	ELI GEDDINGS, HENRY R. FROST.

TENNESSEE.

State Medical Society,	IRA CONWELL, R. C. FOSTER.
University of Nashville,	J. B. LINDSLEY, WM. K. BOWLING.

KENTUCKY.

State Medical Society,	W. L. SUTTON.
Med. Depart. Univer. of Louisville,	S. D. GROSS.

Kentucky School of Medicine,	J. B. FLINT.
Louisville Medical Hospital,	D. W. YANDELL.
U. S. Marine Hospital,	R. J. BRECKENRIDGE.

OHIO.

State Medical Society,	C. COCHRAN, H. O. MACK, T. W. GORDON, WM. TREVITT, C. ROBERTSON, J. P. HENDERSON, R. HILLS, A. CAREY, W. W. JONES, J. A. SAYLES, J. C. MAGGUIN, B. TAPPAN, F. T. HURXTHAL, B. SHELDON, J. N. GARD, G. F. MITCHELL, JNO. A. SMITH, A. MUSGROVE, S. BONNER, W. L. SCHENCK.
Medico-Chirurgical Society,	WM. CLENDENNIN, L. C. RIVES.
Miami Medical College,	R. D. MUSSEY, GEO. MENDENHALL.
Hardin County Medical Society,	W. H. PHILIPS, A. W. MUNSON.
Ohio Lunatic Asylum,	RICHARD GUNDRY.
Athens, Morgan, and Washington Medical Society,	ISAAC HEUSTIS, SMITH BRANSON.
Montgomery County Med. Society,	H. G. CAREY, C. MCDERMOT.
Dark County Medical Society,	ALFRED AYERS.
Stark County Med. Society,	LEWIS SLUSSER.
Medina County Medical Society,	HENRY SPILLMAN, E. H. SILBY.

Erie County Medical Society,	A. AUSTIN, DANL. TILDEN, H. J. DONOHUE.
Union Med. Assoc., Northern Ohio,	L. D. GRISWOLD.
Miami County Medico-Chir. Society,	G. VOLNEY DORSEY, B. NEFF.
Morgan County Medical Society,	T. W. WHITE.
Ohio Medical College,	S. G. ARMOR.
Permanent Member,	R. R. MCMEANS.
By Invitation,	JAS. BRONSON, BENJAMIN STANTON, I. EAMES, JOSH. CLEMENTS.

INDIANA.

State Medical Society,	GEORGE SUTTON, DAVID HUTCHINSON, D. MEEKES, WM. R. WINTON, R. A. CAMERON.
Huntingdon County Med. Society,	WM. B. LYONS.
Cambridge City Med. Association,	S. S. BOYD.
St. Joseph's County Med. Society,	LOUIS HUMPHREYS.
Allen County Medical Society,	B. S. WOODWORTH, H. P. AYRES.
Marshall County Medical Society,	JOSEPH BRELSFORD.
Grant County Medical Society,	JAMES S. DICKEN.
Putnam County Medical Society,	M. D. DARNALL.
Permanent Members,	LEVI D. SHEETS, LANDON C. ROSE.
Members by Invitation,	CALVIN WEST, G. F. MCCARTHY, THOS. M. FRANKLIN.

ILLINOIS.

State Medical Society,	A. S. MCARTHUR, S. T. TROWBRIDGE, F. K. BAILEY, RUDOLPHUS ROUSE, S. Y. BALDWIN, C. GOODBRAKE, DAVID PRINCE, H. NOBLE.

Cook County Medical Society,	JAMES BLOODGOOD, HENRY PARKER, E. ANDREWS, J. H. HOLLISTER, WM. VARIAN.
La Salle County Medical Society,	C. HARD, PHILIP KIRWAN.
Jersey County Medical Society,	H. C. HARRIMAN.
Rock Island Medical Society,	P. GREGG, WM. A. KNOX.
Henry County Medical Society,	T. D. FITCH.
Madison County Medical Society,	HEZ. WILLIAMS, Jr.
Æsculapian Society,	E. C. BANKS.
Hancock Medical Association,	CHAS. COOLIDGE.
McLean County Medical Society,	A. H. LUCE.
Coles County Medical Society,	V. R. BRIDGES.
Adams County Medical Society,	S. W. EVERETT, WM. C. HARRINGTON.
St. James' Hospital,	DE LASKIE MILLER.
Mercy Hospital,	N. S. DAVIS.
Rush Medical College,	JAS. W. FREER, D. BRAINARD.
Permanent Members,	A. B. PALMER, EDW. DICKINSON.

IOWA.

Dubuque Medical Society,	R. S. LEWIS.
oll. Phys. & Surg., Iowa Univer.,	D. L. MCGUGIN.
Iowa Medical College,	E. C. FRANCIS.
State Medical Association,	JOHN M. ADLER.

WISCONSIN.

State Medical Society,	JOHN B. DOUSMAN, D. COOPER AYRES, C. G. PEASE, HAYS MCKINLEY, WM. H. BRISMADE.
Dane County Medical Society,	C. B. CHAPMAN, S. S. THORN.

MICHIGAN.

State Medical Society,	M. A. PATTERSON, E. D. CONE, S. DENTON, R. S. RICE, E. WELLS, P. TILLSON, J. C. GORTON, H. P. COBB, GEO. B. RUSSELL, S. R. ARNOLD.
Detroit Medical Society,	MORSE STEWART, J. A. BROWN, L. G. ROBINSON.
St. Mary's Hospital,	R. INGLIS, E. P. CHRISTIAN.
Serapion Society,	C. P. SEELY, A. O. POTTER, C. P. FANNER, S. H. DOUGLASS, P. KLEIN.
Grand River Valley Med. Assoc.,	ALONZO PLATT, CHAS. SHEPARD.
Med. Depart. Univer. of Michigan,	A. SAGER, M. GUNN.
Southwestern District Med. Society,	B. BARNUM, B. P. WELLS, LEANDER D. TOMPKINS.
Saginaw County Medical Society,	JOHN B. WHITE.
Northeastern Medical Society,	CYRUS M. STOCKWELL, JARED KIBBEE, A. R. STONE, C. MCCOLLUM, W. H. HAZE, M. C. KINNEY, JOHN S. SMITH, ALBERT C. LEETE.
Shiawassee County Medical Society,	E. LEACH.
Van Buren County Med. Society,	H. C. CLAPP.

Calhoun County Medical Society,	EDWARD COX, SIMEON S. FRENCH, DWIGHT NIMS.
Michigan Central Medical Society,	JAS. A. LEASIA.
Permanent Members,	Z. PITCHER, WM. BRODIE, N. D. STEBBINS, A. L. LELAND, HENRY TAYLOR, J. ANDREWS, I. PADDACK.
By Invitation,	S. B. FRENCH, W. O'DONOUGHUE, E. R. THORNTON, C. F. ASHLEY, P. N. CURTIS, DR. SAUNDERS, H. F. EWERS, ALEX. EWING, M. H. ANDREWS, J. R. COATES, D. C. BRIGGS, EDWARD COX, R. K. MANIATES, WM. H. STEVENS.

MINNESOTA TERRITORY.

Union Med. Society of St. Anthony and Mineapolis,	CHAS. W. LE BOUTILLIER.
Med. Soc. of Minnesota Territory,	THOS. R. POTTS.

UNITED STATES ARMY.

Newport Barracks, Ky.	CHAS. TRIPLER.

BRITISH PROVINCES.

By Invitation,	E. M. HODDER, Toronto, C. W. N. BETHUNE, " " W. HASWELL, " " J. H. RICHARDSON, " "

By Invitation,

G. COATSWORTH, Kingsville, C. W.
JNO. TARQUAND, Woodstock, "
S. A. SCOTT, " "
A. K. DEWSON, Windsor, "

Dr. THOMSON, of Delaware, then moved that a recess of fifteen minutes be taken, in order that the delegations of the respective States might have an opportunity to appoint a member to serve on the Committee on Nominations. Carried.

At the expiration of the recess, the Association was called to order, and the different State delegations then reported their choice, respectively, of delegates to serve on the Nominating Committee, which was constituted as follows:—

N. P. MONROE, Maine,
HOSEA PIERCE, N. H.,
C. L. ALLEN, Vermont,
H. H. CHILDS, Mass.,
J. E. WARREN, R. I.,
DAVID HARRISON, Conn.,
WM. ROCKWELL, N. Y.,
LYNDON A. SMITH, N. J.,
JOHN NEILL, Penna.,
J. W. THOMSON, Del.,
P. WROTH, Maryland,
E. GIDDINGS, S. C.,
J. BERRIEN LINDSLEY, Tenn.,
W. L. SUTTON, Ky.,
MOSES GUNN, Mich.,
T. W. GORDON, Ohio,
W. R. WINTON, Ind.,
H. NOBLE, Ill.,
W. H. BRISBANE, Wisconsin,
C. W. BOUTILLIER, Min. Terr.,
CHAS. TRIPLER, U. S. A.,
D. L. MCGUGIN, Iowa.

Dr. PITCHER, Chairman of Committee of Arrangements, recommended that, in conformity with the domestic and social usages of the place of meeting, the sessions of the Association take place in accordance with the following plan, and that they commence and terminate each day at the hours designated therein, as follows:—

Tuesday Morning Session, from 11 o'clock A. M. to 12½ P. M.
" Afternoon " " 2 " P. M. " 5 "
Wednesday Morning " " 9 " A. M. " 12½ "
" Afternoon, no Session.
Thursday Morning Session, from 9 o'clock A. M. to 12½ P. M.
Afternoon " " 2 " P. M. " 5 "
Friday Morning " " 9 " A. M.

The Committee under the resolutions* offered by Dr. N. S. DAVIS, at the last meeting, held in the city of Philadelphia, reported as follows: That in view of the present state of our professional literature, they feel reluctant to advise a departure from the present mode of laboring to promote a higher degree of culture in those preparing to become members of the medical profession, and to establish in those already engaged in its duties, a habit of recording the results of their observations.

They think the effect of such a change as is contemplated in the resolutions of Prof. Davis, and the more amplified expression of this idea, contained in the address of the then President, Dr. POPE, of Missouri, delivered at Philadelphia, in 1855, can be easily foreseen.

To a few who are gifted with colloquial powers, and to others who have undergone the discipline required to fit them for public debate, the interest of the meetings conducted upon the plan proposed in the resolutions, would be greatly increased, but as the great body of the Association would, voluntarily it is true, be excluded from participation in these exercises, the enthusiasm which now characterizes our anniversaries would subside, and with it the professional *esprit du corps*, which has been already developed through the instrumentality of the Association.

We presume the objects for which this organization was effected have not been lost sight of by a majority of its members; neither

* *Whereas*, The present mode of conducting the annual meetings of the Association affords but little opportunity for the discussion of strictly scientific questions and papers, and

Whereas, This has been regarded as a serious defect in the operation of our organization, impairing its scientific character, therefore

Resolved, That the daily sessions of the Association, during each annual meeting, be divided into two parts—the first to terminate at an hour not later than 12½ o'clock P. M., each day, and to be devoted, as heretofore, to the general business of the Association—the second, consisting of all the time during which it is deemed advisable to remain in session each day, after 12½ o'clock P. M., to take the character of a scientific session, and to be devoted exclusively to the discussion of questions relating to the science and art of medicine.

Resolved, That the Association, in its capacity of a scientific body, having no power to act on any subject except of a scientific character, may continue in session, whenever thought advisable, a longer period than in its more general capacity.

Resolved, That the foregoing preamble and resolutions be referred to the Committee of Arrangements, with instructions to report on the same at the commencement of the next annual session.

can it be pretended that those purposes have been so far accomplished as to justify us in laying it aside, or of diverting it from its original design.

Your Committee feel that the Profession has no right to rail at the public for misappreciation of it, so long as we continue to admit men into its folds destitute of that knowledge, both in nature and degree, necessary to make a decent appearance in general society, or to fit a man for the more ordinary and less responsible pursuits of life.

From the early records of the Association, it appears that this conviction on the part of the profession of the United States, connected with the design of reforming, in certain particulars, the medical schools of our country, led to its organization in 1847. And, until its mission in both respects has been accomplished, the Committee would reluctantly recommend the adoption of any measure tending, in their judgment, to divert it from the design of its creation.

Thus far the influence of the Association has gradually extended itself into the rank and file of the profession. It has increased the number of writers, given an impulse to the medical mind, and encouraged a useful and laborious class, qualified to observe, and willing to submit their observations to the public, because they can be incorporated into the body of the *Transactions* without being subjected to a sifting criticism.

It is true that, in this way, articles have been printed that did not always enure to the credit of the Association, but, at the same time, and by that means, motion and fertility have been given to minds that would have lain fallow and unproductive, which the dread of the conspicuity belonging to a mental gymnasium would have driven into deeper obscurity.

The Committee, however, whilst they would resist any tendency to radicalism in their own opinions, cannot dismiss the subject without expressing their belief, that, in order to secure the objects of our organization, it is as necessary to increase the breadth and depth of its base as to elevate the shaft designed to spring from it, for, without such preparation, the superstructure, however beautiful in aspect, would be of transient duration. Having arranged the hours for meeting and adjourning, so as to place it in the power of the Association to adopt or reject without inconvenience the resolutions of Dr. DAVIS, the Committee respectfully ask to be excused from submitting a distinct proposition on the subject.

On motion, the report was accepted.

The President, Dr. WOOD, announced the regrets of Dr. FRANCIS WEST, one of the Secretaries, at not being able to be present at the meeting. Also of Dr. D. HUMPHREYS STORER, one of the Vice-Presidents.

The Secretary, Dr. BRODIE, read a letter from Dr. GRAFTON TYLER, one of the Vice-Presidents, regretting his inability to be present, and expressing his abiding interest in the prosperity of the Association.

The President announced the death of Dr. JOHN C. WARREN, of Boston, one of the former Presidents of the Association.

Dr. H. H. CHILDS, of Mass., in a few brief remarks, paid a just and handsome tribute to his memory.

Dr. GROSS, of Kentucky, rose to confirm the remarks made by Dr. CHILDS, and moved that a committee of five be appointed by the Chair, to draft resolutions expressive of the feelings of this Association for the loss of their late associate, Dr. J. C. WARREN. Carried.

The President appointed

Drs. GROSS, of Kentucky,
" CHILDS, of Massachusetts,
" WOOD, of New York,
" PITCHER, of Michigan,
" GEDDINGS, of South Carolina.

In honor of the memory of Dr. WARREN, the Association then adjourned.

AFTERNOON SESSION, 2 *o'clock P. M.*

The Secretary read a communication from the Medical Department University of Nashville, and from the Tennessee State Medical Society, inviting the Association to hold their next meeting in Nashville, Tenn.

Also, an invitation from the General Assembly, tendering the use of their chamber for the Association.

All of which were, on motion, referred to the Committee on Nominations.

The Committee on Nominations, through their Chairman, Dr. THOMSON, reported, in part, as follows, which report was, on motion, unanimously adopted:—

PRESIDENT,

ZINA PITCHER, *Michigan.*

VICE-PRESIDENTS,

THOS. W. BLATCHFORD, *N. Y.*, E. GEDDINGS, *S. Carolina*,
WM. K. BOWLING, *Tenn.*, WM. H. BRISBANE, *Wisconsin.*

SECRETARIES,

WM. BRODIE, *Detroit, Michigan*, R. C. FOSTER, *Nashville, Tenn.*

TREASURER,

CASPAR WISTER, *Philadelphia, Pa.*

On motion of Dr. J. L. ATLEE, the President, Dr. WOOD, was requested to read his annual address.

The President then delivered the annual address, after which, on motion of Dr. ATLEE, of Penn., the thanks of the Association were unanimously tendered to the President, for his able and interesting address, and he was requested to furnish a copy of the same to the Committee of Publication.

Dr. TILDEN, V.P., in the chair.

On motion of Dr. ATLEE, a committee of three was appointed by the Chair to conduct the newly elected officers to their seats.

Committee.—DRS. ATLEE, of Pa., RIVES, of Ohio, and SUTTON, of Kentucky.

The newly elected officers were then conducted to their respective chairs by the Committee.

The newly elected President, Dr. PITCHER, on taking his seat, returned his sincere thanks to the Association for the honor, conferred not only upon himself, but upon the Profession in Detroit and the State of Michigan; expressed the abiding interest he had always felt for the Association's welfare and prosperity, and assured them that his best endeavors should be used to maintain its reputation unsullied.

On motion of Dr. FROST, of South Carolina,

Resolved, That the thanks of this Association are due to the retiring officers, for the zealous and efficient manner in which they have performed their duties.

To our late President, for the courtesy and ability with which he

has presided over our deliberations. To all the officers, for their attention to the laborious duties of their stations, not excepting our Committee of Publication, to whom we must feel indebted for the satisfactory form in which the volume of the *Transactions* appears.

On motion of Dr. GUNN, of Michigan,

Resolved, That the resolutions adopted by the Association at its session in St. Louis, in 1854, requiring the Committee of Publication to be selected from the place where the meeting should be held, be repealed.

Dr. JAS. L. PHELPS, of N. Y., offered the following preamble and resolution, which, after a motion to lay on the table, were adopted:—

Whereas, The pleasure and satisfaction of attending the deliberations of this Association would be greatly enhanced, the duties of the secretaries and reporters facilitated, and order, at the same time, secured by the observance of two things, to wit: First, that the audience be put in possession of the name and residence of the Speaker; and, secondly, that they be enabled distinctly to hear what he has to say: Therefore,

Resolved, That no one be permitted to address the Association, except he shall have first given his name and residence, which shall be distinctly announced from the Chair, and the member be required to go forward and speak from the stand, and not more than ten minutes at one time.

Dr. GROSS, of Kentucky, stated his readiness to make his report "On the Causes which Retard the Progress of Medical Literature." On motion, it was made the special order for Wednesday, at 10 o'clock A. M.

Reports of Standing Committees being in order, Dr. A. B. PALMER, Chairman of Committee on Prize Essays, reported: That the Committee had received four papers for consideration, and that they had given the preference to one bearing the title of "The Physiology of the Arterial Circulation, and its principal pathological relations," and bearing the following motto: *Una est Veritas.*

On motion of Dr. ATLEE, the report was accepted, and the Essay referred to the Committee of Publication. On breaking the seal of the accompanying packet, Dr. H. HARTSHORNE, of Philadelphia, was found to be the successful competitor.

Dr. BLATCHFORD, of N. Y., Chairman of the Committee on "Hydrophobia, and the Connection of the Year with its Preva-

lence," read his report thereon, and submitted the following resolution, which was adopted:—

Resolved, That the Secretary transmit to the Governor of each State, a copy of the statistical part of this report, with the respectful request that he would bring the subject before the Legislature of the State over which he presides, that, in their wisdom, they may devise and unite upon a plan by which the evil may be mitigated, if not removed.

On motion of Dr. ATLEE, the report was referred to the Committee of Publication.

The Committee on Nominations reported Nashville, Tennessee, as the place for the next meeting of the Association.

Dr. GROSS moved to amend the report, by inserting Louisville in the place of Nashville, which, after some remarks, was lost. The report was then adopted.

The Committee of Publication made their report, through the Treasurer, which, on motion, was accepted, and referred to the Committee of Publication, for 1856.

The Committee of Publication submitted the following resolution, which, after some remarks, was adopted:—

Resolved, That hereafter, commencing with the session of 1856, no report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Committee of Publication on or before June 1.

Dr. ATLEE offered the following resolution:—

Resolved, That the Committee of Publication be required to retain at least five complete sets of the *Transactions*. Carried.

Dr. WOOD, of Pa., moved to refer the nomination of Standing Committees to the Nominating Committee. Carried.

On motion of Dr. WOOD, the Committee on "Deformities after Fractures," of which Dr. F. H. HAMILTON, of Buffalo, N. Y., is chairman, was continued.

Dr. BRECKENRIDGE, of Ky., Chairman of Committee on Medical Literature, for 1855, stated that he was ready to report; also, Dr. PALMER, Chairman of Committee on "Plan of Organization for State and County Medical Societies." On motion, these reports were made the order to follow that of Dr. GROSS, at 10 o'clock Wednesday.

On motion of Dr. SMITH, of New Jersey, that portion of the

resolution requiring members, when speaking, to take the stand, was rescinded.

Dr. WISTER, of Pa., Treasurer, made his annual report, which, on motion, was accepted, and referred to the Committee of Publication.

Dr. GUNN, of the Committee of Arrangements, reported the following names of members by invitation:—

Dr. P. N. CURTIS, of Tecumseh, Michigan,
" CALVIN WEST, of Hagerstown, Indiana,
" JAMES BRONSON, of Newton Falls, Ohio,
" BENJAMIN STANTON, of Salem, Ohio,
" EAMES, of do.,
" R. K. MANIATES, of Marshall, Michigan.

Which report, on motion, was adopted.

The President read a communication from Dr. STILLÉ, Chairman of the Committee appointed last year to consider the subject of extending the lectures of each chair in medical schools over a period of two years, asking to be continued, which was, on motion, granted.

An invitation was received from the American Association for the advancement of science, to meet with them in Albany, N. Y., in August next, at which time, also, the Dudley Observatory will be inaugurated, and an address delivered by the Hon. EDWARD EVERETT.

On motion, the invitation was accepted.

The Association then adjourned, to meet to-morrow morning at 9 o'clock.

WEDNESDAY, *May* 7.

The Association met at 9 A. M., the President in the chair. The minutes of last meeting were read and approved.

The Secretary read communications from

Dr. SEMMES, Chairman of Committee on "Coroners' Inquests."

Also from Dr. J. TAYLOR BRADFORD, Chairman of Committee on "Treatment of Cholera."

Dr. D. MEREDITH REESE, Chairman of Committee on the "Causes of Infant Mortality in Large Cities, &c."

Dr. E. R. PEASLEE, Chairman of Committee on "Inflammation, &c."

Dr. J. W. CORSON, on the "Causes of the Impulse of the Heart, &c."

Dr. M. STEPHENSON, on the "Treatment best adapted to each Variety of Cataract, &c."

Dr. J. C. HUTCHINSON, on the "Anatomy and Histology of the Cervix Uteri."

Dr. J. BEECH, Chairman of Committee on "Medical Topography for the State of Michigan."

All asking to be continued, and which, on motion, were referred to the Committee on Nominations.

A communication was received from Dr. F. H. HAMILTON, of Buffalo, asking that the minutes of 1855 be amended, so as to continue him as Chairman of a Special Committee on "Deformities after Fractures," he being continued, but the minutes not so expressing it.

On motion of Dr. BRODIE, the minutes were ordered to be so amended.

Dr. ATLEE offered the following resolution: "That Dr. HAMILTON be permitted to use that portion of his report on "Deformities after Fractures" already published by the Association, to be incorporated in his work on the *Deformities after Fractures and Dislocations.*

On motion of Dr. A. B. PALMER, the resolution was referred to a committee of three, consisting of Drs. A. B. PALMER, J. L. ATLEE, and R. HILLS.

The Committee of Arrangements reported the following gentlemen as members by invitation:—

Dr. EDWARD COX, Battle Creek, Michigan,
" S. B. FRENCH, " " "
" W. O'DONOUGHUE, " "
" S. A. SCOTT, Woodstock, C. W.,
" E. R. THORNTON, Belleville, Michigan,
" FOSTER, Unadilla, "
" HOLLY, Shiawassee, "
" W. H. STEVENS, Saline, "
" THOMAS M. FRANKLIN, Laporte, Ind.

On motion, the report was accepted.

Dr. GUNN moved that those gentlemen from the British Provinces who are here by a general invitation, be admitted in a body, and requested to take seats on the platform for the morning's session. Carried.

Dr. E. M. HODDER, of Toronto, C. W.,
" N. BETHUNE, " "
" W. HASWELL, " "

Dr. G. COATSWORTH, Kingsville, C. W.,
" J. H. RICHARDSON, Toronto, "
" J. TARQUAND, Woodstock, "
" A. K. DEWSEN, Windsor, "

were conducted to the chair, and received by the President, who said "that he was happy to be the instrument of celebrating the nuptials by which we effect a scientific reunion of the two members of the Anglo-Saxon race on this continent, which have been so long separated by political relations having their origin in the separation of the American Colonies from the British Crown."

Dr. HODDER, in behalf of the Canadian delegation, thanked the Association for the courtesy and kindness extended to them.

On motion of Dr. SUTTON, of Kentucky, one thousand copies of the address of the late President, Dr. WOOD, were ordered to be published for the use of the permanent members of the Association. Carried.

On motion of Dr. J. B. LINDSLEY, of Tennessee,

Resolved, That a committee of three be appointed by the Chair, to prepare a suitable minute in reference to the death of our late Secretary, Dr. P. CLAIBORNE GOOCH, of Richmond, Virginia, who fell a martyr while contending with the pestilence in Norfolk, in 1855.

The President appointed as such committee—
Dr. LINDSLEY, of Tennessee,
" THOMSON, Delaware,
" MENDENHALL, Ohio.

Dr. GROSS, of Kentucky, from a committee appointed to draft resolutions relative to the death of Dr. J. C. WARREN, reported the following resolutions:—

Whereas, It has pleased Almighty God to remove from the scene of his earthly labors our late fellow member, Dr. J. C. WARREN, of Boston, formerly President of this Association, and for many years Professor of Anatomy and Surgery in Harvard University; *And whereas*, It is just and proper that when a great and good man dies his memory should be cherished by his fellow-citizens, and transmitted unimpaired to posterity for the encouragement of future generations, therefore—

Resolved, That this Association has learned with deep regret the news of an event which has deprived the American medical profession of one of its oldest, most useful, and most illustrious members; American Surgery of one of its greatest ornaments;

science, of one of its best friends, and humanity one of its noblest benefactors.

Resolved, That the life of Dr. J. C. WARREN affords an example of a man who, notwithstanding the possession of ample riches, devoted himself heart and soul for upwards of half a century to the cultivation and advancement of his profession, and to the good of the human race.

Resolved, That this Association deeply sympathizes with the family of Dr. WARREN in their bereavement, and that the Secretary be requested to transmit to them a copy of these proceedings.

On motion, the above preamble and resolutions were adopted by a silent vote.

Dr. GROSS then read his report "On the Causes which retard the Progress of American Medical Literature," and recommended the adoption of the following resolutions:—

Resolved, That this Association earnestly and respectfully recommends: 1st. The universal adoption, whenever practicable, by our schools, of American works as text-books for their pupils. 2d. The discontinuance of the practice of editing foreign writings. 3d. A more independent course of the medical periodical press towards foreign productions, and a more liberal one towards American; and 4th. A better and more efficient employment of the facts which are furnished by our public institutions for the elucidation of the nature of diseases and accidents, and indirectly for the formation of an original, a vigorous, and an independent national medical literature.

Resolved, That we venerate the writings of the great medical men past and present of our country, and that we consider them as an important element of our national medical literature.

Resolved, That we shall always hail with pleasure any useful or valuable work emanating from the European press, and that we shall always extend to them a cordial welcome as books of reference, to acquaint us with the progress of legitimate medicine abroad, and to enlighten us in regard to any new facts of which they may be the repositories.

Dr. PHELPS, of New York, moved that the report and resolutions be adopted.

On motion, the question was divided, when the report was adopted.

On motion, the 1st resolution was amended so as to read "*just*" for "*liberal*."

On motion of Dr. DAVIS, the resolutions were laid on the table,

until the report of Dr. BRECKENRIDGE on "American Medical Literature" should be read.

The Secretary read a communication from Dr. JEWETT, Chairman of Committee "to procure Memoirs of the Eminent and Worthy Dead," with such reports as he had received; which reports and communications were referred to the Committee of Publication.

Dr. BRECKENRIDGE read his report on "American Medical Literature," which was, on motion of Dr. C. HOOKER, of Connecticut, received and referred to the Committee of Publication.

The President then gave an invitation to the Association, to an excursion on the Steamboat Western World, at 3 o'clock P. M. After which the Association adjourned.

THURSDAY, *May* 8, 9 *o'clock A M.*

Third day, morning session.

The Association was called to order by the President.

The minutes were read, corrected, and approved.

A communication was read from Dr. P. WROTH, of Maryland, relative to his report upon the "Medical Topography of the Eastern Shore of Maryland." Also one from Dr. THOMSON, of Kentucky, relative to his report on "Chloroform," asking to be continued. On motion, both were referred to the Committee on Nominations.

The Secretary read a letter from Dr. E. S. LEMOINE, inclosing an autograph letter from M. Dubois, of Paris, Secretary of the "Imperial Academy of Medicine," thanking the Association for copies of its *Transactions*, from vol. i. to vol. vii., inclusive. On motion, accepted, and the autograph returned to Dr. LEMOINE.

A communication was received from J. C. HOLMES, Esq., Secretary of the Michigan State Agricultural Society, presenting to the Association twenty-five copies of the *Transactions* of the Society for 1853, and also the same number for 1854.

Dr. BRODIE moved that the thanks of the Association be returned therefor, and that one copy be presented to each State represented. Carried.

On motion, Dr. MCGUGIN, of Iowa, was appointed to represent that State in Committee on Nominations.

On motion of Dr. ATLEE, of Pennsylvania,

Resolved, That the President shall be authorized annually to appoint delegates to represent this Association at the meetings of

the British Association, the American Medical Society at Paris, and such other scientific bodies in Europe as may be affiliated with us.

Dr. ISADOR GLÜCK, of New York, presented the following:—

Whereas, A Medical Congress is to be held in Europe during the present year—

Resolved, That the American Medical Association send to that Congress four delegates representing the four sections of the Union. On motion of Dr. DAVIS, laid on the table.

Dr. CLENDENIN, of Ohio, offered the following resolution, which on motion was referred to the Committee on Nominations.

Resolved, That a committee of one be appointed for a period of three years, with instructions to report at each annual meeting of this Association, to investigate the Etiology and Pathology of Epidemic Cholera, and that said committee be allowed to add any other members he may think necessary to further the objects of their appointment.

Dr. MENDENHALL, of Ohio, offered the following resolution:—

Resolved, That the Secretary be instructed to strike the name of C. H. CLEVELAND from the list of Permanent Members of this Association. Adopted.

Dr. ATLEE, of Pennsylvania, offered the following resolution:—

Resolved, That the name of JAS. MCCLINTOCK be stricken from the list of permanent members. Adopted.

On motion of Dr. BISSELL, of New York,

Resolved, That this Association has learned with deep regret the death of one of its members, Dr. T. ROMEYN BECK, of Albany, New York, whose whole life has been devoted to the attainment and promotion of medical and general sciences; and that we do hereby express our high appreciation of the excellencies of his character, distinguished by its simplicity, integrity, and firmness of purpose, and by the extent and variety of his acquirements in medicine as in almost every other department of science.

On motion,

Resolved, That the above resolution be referred to the Committee to procure Memoirs of the eminent and worthy dead, and that they be requested to procure a suitable memoir of the late Dr. BECK, to be published in the *Transactions* of the Association.

Dr. GUNN, from the Committee of Arrangements, presented the following gentlemen as members by invitation. Dr. ASHLEY, of Ypsilanti, Michigan; Dr. H. F. EWERS, of Union, Michigan; Dr. ALEX. EWING, of Dexter, Michigan; Dr. REYNALL, of Dansville,

New York; Dr. G. F. McCarthy, of Indiana; Dr. M. H. Andrews, of Jonesville, Michigan; Dr. J. B. Coates, of Kalamazoo, Michigan; Dr. Wm. H. Stebbins, of Saline, Michigan; Dr. D. L. Briggs, of St. Joseph County, Michigan. Accepted.

On motion of Dr. Wister, of Pennsylvania,

Resolved, That the invitation to gentlemen of the medical profession of the neighboring British provinces, extended to them by the American Medical Association at its session in Philadelphia, be renewed for the meeting at Nashville, Tennessee, in 1857. And that this Association may be safe from the introduction of unsuitable persons, it is recommended that gentlemen, presenting themselves from the British provinces, should be provided with a letter of introduction to this Association from one of the following gentlemen:—

Drs. Jno. Tarquand and A. Scott, Woodstock, Canada West; Drs. E. M. Hodder, N. Bethune, J. H. Richardson, Bonell, Haswell, Widmer, Beaumont, and Herrick, Toronto, Canada West; Drs. O'Rielly, Craggie, Duggan, Hamilton, do.; Sampson, Kingston, do.; Geo. Holmes, London, do. Adopted.

Dr. Phelps, of New York, offered the following:—

Whereas, It has pleased an All-wise but Inscrutable Providence to visit the city of Norfolk, Virginia, with a desolating pestilence, equal, or surpassing, anything in ancient or modern times, and by which, in a few weeks, forty physicians, either residents, or those from abroad, who had promptly rushed to the rescue, among the number of whom was our late Secretary, P. Claiborne Gooch, M. D., of Richmond, Virginia, were swept away, therefore

Resolved, That such an instance of signal and unflinching devotion to the cause of science and humanity demands at the hands of this national Association a passing expression of their high admiration of this, another memorable instance of the unparalleled sacrifices of the profession to the interests of the healing art and of our race.

Resolved, That this minute be incorporated in our *Transactions*. Adopted.

On motion of Dr. A. B. Palmer, the Rt. Rev. S. A. McCrosky, Episcopal Bishop of the diocese of Michigan, being present, was invited by the President to take a seat on the platform.

Dr. Mussey, of Ohio, one of the former Presidents of the Association, was also invited to a seat on the platform.

Dr. Stocker, of Pennsylvania, moved to amend the Constitution as follows:—

Article 3. Strike out all after the words "first Tuesday in May," and insert as follows:—

The Association shall meet biennially in the city of ———. The place of meeting for the intermediate year shall be determined by a vote of the Association.

Article 4. In first paragraph, second line, instead of the words "two Secretaries" insert one permanent and two assistant Secretaries.

In 4th paragraph, 5th line, strike out the words the Secretary, &c., and substitute "The *permanent* Secretary shall preserve the archives and unpublished transactions in the permanent place of meeting of the Association. His expenses for travelling to and from the place of meeting, and while in attendance upon the same, shall be defrayed by the Association.

Laid upon the table for one year under the rule.

Dr. DORSEY offered the following:—

Resolved, that in May, 1858, and every third year thereafter, this Association meet in Washington, D. C., and that the present officers be requested to correspond with the Board of Managers of the Smithsonian Institute, in regard to furnishing necessary rooms for the keeping of the archives of the Association. Laid over.

Dr. L. D. SHEETS, of Ohio, offered the following:—

Resolved, That it is derogatory to the dignity of the medical profession to notice the works of irregular practitioners in our medical periodicals. Adopted.

On motion of Dr. WATSON, of New York, reports of Committees were made the special order.

Dr. COVENTRY, of New York, moved to reconsider the vote making the report of special committees the order, for the purpose of taking up the resolutions attached to the report of Dr. GROSS, "On the Causes which retard the Progress of American Medical Literature." Carried.

Dr. WATSON, of New York, moved to reconsider the vote by which the report was adopted. Carried.

Dr. WATSON then moved that the report be accepted. Carried.

On motion of Dr. ATLEE, of Pennsylvania, the report and resolutions of Dr. GROSS, and the report of Dr. BRECKENRIDGE, of Kentucky, upon Medical Literature, were referred to the Committee of Publication.

The Special Committee to whom was referred the communication from Dr. HAMILTON, of Buffalo, New York, reported as follows:—

That they have had the same under consideration, and beg leave to present the following. The facts seem to be that, two years since, Dr. HAMILTON was appointed a special committee of this body to report upon "Deformities after Fractures." A portion of the report was presented last year and published in the *Transactions*. Another portion is now in the hands of the Secretary, and the concluding part is promised, if the Association desire it, for the next year. Dr. HAMILTON states that he is now preparing for the press a volume on "Dislocations and Fractures," of which he wished the several parts of the paper presented, and to be presented to this body, to constitute a considerable portion, and he asks the Association to consent to this use of what he acknowledges its property.

While the Association, in accordance with a resolution passed two years since, has reason to regard all papers presented to it as its own property, and subject entirely to its control; still, as there can be no desire to restrict the diffusion of knowledge, or make any exclusive or undue use of the voluntary labors of any, and as the publication of this matter in another form will do no injury to the Association, the Committee are of the opinion that leave should be granted to Dr. HAMILTON to make such use of the materials in question, as he has so respectfully asked. The passage of the following resolution is therefore recommended.

Resolved, That leave be granted Dr. F. H. HAMILTON to make use of the materials of his report on "Deformities after Fractures," which is in course of presentation to this Association, in his anticipated work on "Fractures and Dislocations;" provided that this work be not published until after the completion of the report in the published *Transactions* of the Association.

Signed A. B. PALMER,
JOHN L. ATLEE,
R. HILLS,
Committee.

On motion, the resolution was adopted.

Dr. A. B. PALMER, Chairman of the Committee "On Plans of Organizations of State and County Medical Societies," read his report with accompanying resolutions.

On motion of Dr. ATLEE, the report was accepted, and referred to the Committee of Publication, and the resolutions laid on the table for future consideration.

Dr. N. S. DAVIS, of Illinois, Chairman of the Committee "On the

Changes in the Composition and Properties of Milk by Pregnancy and Menstruation," read his report, which on motion was accepted, and referred to the Committee of Publication.

Dr. LEWIS H. STEINER, Chairman of Committee on "Strychnia, its Chemical and Toxicological Properties," presented his report through the Secretary, which on motion was accepted, and referred to Committee of Publication.

Dr. CHARLES Q. CHANDLER, of Rockfort, Missouri, Chairman of Committee on "Malignant Periodic Fevers," presented a substitute for his report, which on motion was referred to the Committee of Arrangements.

Dr. H. A. JOHNSON, of Chicago, Illinois, on the "Excretions as an Index to the Organic Changes going on in the System," asked for further time. On motion, was referred to the Committee on Nominations.

Dr. JAMES M. NEWMAN, of Buffalo, N. York, Chairman of Committee on the "Sanitary Police of Cities," read an abstract of his report, when, on motion, the report was accepted, and referred to the Committee of Publication.

The Association then adjourned to 2 o'clock.

AFTERNOON SESSION.

The Association met at 2 o'clock, the President in the chair.

The reading of reports from Committees being resumed, Dr. A. J. FULLER, of Maine, read a report on the "Best Treatment of Cholera Infantum," which, on motion, was accepted, and referred to the Committee of Publication.

Dr. H. GREEN, of New York, on the "Use and Effect of Nitrate of Silver to the Throat," read his report, which, on motion, was accepted, and referred to the Committee of Publication.

Dr. J. B. FLINT, of Louisville, Kentucky, Chairman of the Committee on the "Best Mode of Rendering the Medical Patronage of the National Government Tributary to the Honor and Improvement of the Profession," reported, which report was, on motion, accepted, and referred to the Committee of Publication.

Dr. THOMSON, Chairman of the Committee on Nominations, presented the following report for Chairmen of Special Committees for 1857 :—

Dr. E. R. PEASLEE, of Brunswick, Maine, on "Inflammation, its Pathology, and its Relation to the Recuperative Process."

Dr. H. HUTCHINSON, of Brooklyn, New York, and Dr. CHAS. E.

ISAACS, of New York City, on the "Anatomy and Histology of the Cervix Uteri."

Dr. J. TAYLOR BRADFORD, of Augusta, Kentucky, on the "Treatment of Cholera."

Dr. MARK STEPHENSON, of New York City, on the "Treatment best adapted to each Variety of Cataract, with the Method of Operation, place of Election, Time, Age, &c."

Dr. J. W. CORSON, of New York City, on the "Causes of the Impulse of the Heart, and the Agencies which Influence it in Health and Disease."

Dr. D. MEREDITH REESE, of New York City, on the "Causes of Infant Mortality in large Cities, the Source of its Increase, and the Means for its Diminution."

Dr. J. FOSTER JENKINS, of Yonkers, New York, on "Spontaneous Umbilical Hemorrhage of the Newly Born."

Dr. HENRY CARPENTER, of Lancaster, Pennsylvania, on the "Use of Instruments in Obstetrical Practice."

Dr. ALEXANDER J. SEMMES, of Washington, D. C., on the "Measures to be adopted to Remedy the Evils existing in the Present Mode of Holding Coroners' Inquests."

Dr. J. MARION SIMS, of New York City, on the "Treatment of the Results of Obstructed Labor."

Dr. J. B. FLINT, of Louisville, Kentucky, on the "True Position and Value of Operative Surgery as a Therapeutical Agent."

Dr. G. VOLNEY DORSEY, of Piqua, Ohio, on the "Causes and Cure of Indigestion, especially in Relation to the Therapeutic Indications to be derived from the Chemical Compositions of the Deposits of the Urine."

Dr. C. B. COVENTRY, of Utica, New York, on the "Medical Jurisprudence of Insanity, and the Testimony of Skilled Witnesses in Courts of Justice."

Dr. JOSEPH LEIDY, of Philadelphia, Pennsylvania, on "Human, Animal, and Vegetable Parasites."

Dr. M. D. DARNALL, of Bainbridge, Indiana, on the "Value of a Strict Attention to Position in the Treatment of Diseases of the Abdomen."

Dr. GEORGE SUTTON, of Aurora, Indiana, on "Milk Sickness."

Dr. CLARK G. PEASE, of Jonesville, Wisconsin, on the "Blending and Conversion of the Types of Fever."

Dr. B. S. WOODWORTH, of Fort Wayne, Indiana, on the "Best

Substitutes for Cinchona and its Preparations in the Treatment of Intermittent Fever and Malarious Neuralgia."

Dr. FRANKLIN HINKLE, of Marietta, Pennsylvania, on the "Use of Cinchona in Malarious Diseases."

Dr. HENRY F. CAMPBELL, of Augusta, Georgia, on the "Nervous System in Febrile Diseases."

Dr. JOHN NEILL, of Philadelphia, Pennsylvania, on the "Laws Governing the Absorption and Deposit of Bone."

Dr. JOHN W. GREEN, of New York City, on the "Intimate Effects of Certain Toxicological Agents in the Animal Tissues and Fluids."

Dr. GEORGE SUCKLY, U. S. A., on the "Medical Topography and Fauna of Washington Territory."

Dr. JAMES COOPER, of Hoboken, New Jersey, on the "Flora of Washington and Oregon Territories."

Dr. CHAS. E. ISAACS, of New York City, on the "Intimate Structure and Pathology of the Kidney."

Dr. ISRAEL MOSES, of New York City, on the "Diseases Incidental to Emigrants from Temperate Climates, in their Transition through Central America."

Dr. T. W. GORDON, of Georgetown, Brown Co., Ohio, on the "Etiology and Pathology of Epidemic Cholera," to be continued three years, and with power to add any other members.

Dr. H. A. JOHNSON, Chicago, Illinois, on the "Excretions as an Index to the Organic Changes going on in the System."

Dr. D. D. THOMSON, of Louisville, Kentucky, on the "Remedial Effects of Chloroform."

Standing Committees.

Committee of Publication.—Dr. FRANCIS G. SMITH, of Pennsylvania, Chairman; Dr. CASPAR WISTER, of do.; Dr. WM. BRODIE, of Detroit, Michigan; Dr. R. C. FOSTER, of Nashville, Tennessee; Dr. SAML. L. HOLLINGSWORTH, of Pennsylvania; Dr. SAML. LEWIS, of do.; Dr. H. F. ASKEW, of Delaware.

Committee on Prize Essays.—Dr. WM. K. BOWLING, of Tennessee, Chairman; Dr. E. B. HASKINS, of do.; Dr. THOMAS LIPSCOMB, of do.; Dr. A. H. BUCHANAN, of do.; Dr. B. W. AVENT, of do.; Dr. W. A. CHEATHAM, of do.; Dr. PAUL F. EVE, of do.

Committee of Arrangements.—Dr. C. K. WINSTON, of Tennessee, Chairman; Dr. IRA CONWELL, of do.; Dr. WM. D. HAGGART, of do.; Dr. J. L. C. JOHNSON, of do.; Dr. F. A. RAMSAY, of do.; Dr. GEORGE GRANT, of do.; Dr. J. B. LINDSLEY, of do.

Committee on Medical Education.—Dr. E. GEDDINGS, of South Carolina, Chairman; Dr. C. W. LE BOUTILLIER, of Minnesota Territory; Dr. G. F. MITCHELL, of Ohio; Dr. S. W. CLANTON, of Alabama; Dr. S. W. BUTLER, of New Jersey.

Committee on Medical Literature.—Dr. R. HILLS, of Columbus, Ohio, Chairman; Dr. D. W. YANDELL, of Kentucky; Dr. R. R. PORTER, of Delaware; Dr. H. A. JOHNSON, of Illinois; Dr. CHARLES E. SWAN, of Maine.

To fill vacancies in the Committee on "Medical Topography and Epidemics":—

New Hampshire.—V. P. FITCH, M. D., of Amherst.

California.—ROBERT MURRAY, M. D., U. S. A., of Fort Miller.

To fill vacancies in the Committee on "The Registration of Births, Marriages, &c.":—

Connecticut.—WM. B. CASEY, M. D., of Middletown.

Vermont.—ADRIAN T. WOODWARD, M. D., of Castleton.

Virginia.—R. W. HAXALL, M. D., of Richmond.

California.—ARTHUR R. STOUT, M. D., of San Francisco.

The Committee also recommend the continuance of the "Committee to Procure Memorials of the Eminent and Worthy Dead;" and that the report, as far as prepared, be referred to the Committee of Publication.

On motion, the report was accepted and adopted, and referred to Committee of Publication.

A communication was presented from W. H. ANDERSON, M. D., Chairman of Committee on "Medical Education," expressing his regrets at not being able to attend the meeting, and accompanied with his report. On motion, the report was accepted, and referred to the Committee of Publication.

A report was received from Dr. P. WROTH, Chairman of a Committee on the "Medical Topography of the Epidemics of Maryland," on the "Medical Topography of the Eastern Shore of Maryland," which, on motion, was accepted, and referred to Committee of Publication.

A report was received, by abstract, from Dr. FENNER, of New Orleans, on the "Medical Topography and Epidemics of Louisiana," which, on motion, was received, and referred to the Committee of Publication.

On motion of Dr. A. B. PALMER,

Resolved, That the volunteer communications in the hands of the Committee of Arrangements, be referred to a special committee to

be appointed by the Chair, at the place of publication of the *Transactions*, and if, in their judgment, the papers are worthy, they be referred by them to the Committee of Publication, to go into the *Transactions* of the Association.

Committee appointed—

Dr. A. STILLE, of Philadelphia,

" S. JACKSON, late of Northumberland,

" J. B. BIDDLE, of Philadelphia.

The authors and titles of the voluntary communications, presented for the consideration of the Association, and so referred, were as follows:—

Dr. C. Q. CHANDLER, of Rocheport, Missouri, on "Sulphate of Cinchonia in Periodic Diseases."

Dr. ISADOR GLÜCK, of New York City, on "Formation of Gunshot Wounds, &c."

Dr. J. P. HACKENBERG, Ohio, on "An Improved Method of Applying Compression to the Scrotum."

A member of the Committee on "A Uniform Method for the Registration of Marriages, Births, and Deaths," stated that the Committee were unable to report, owing to the death of their Chairman, Dr. WILSON, of Connecticut.

On motion, the Committee on "Medical Literature for 1855," was continued another year.

Dr. GROSS, of Louisville, Kentucky, tendered, in behalf of the medical profession and citizens of that city, an invitation to the Association, to meet there in 1858. Ordered to be placed on file.

On motion of Dr. DORSEY, of Ohio,

Resolved, That the Committee on the "Etiology and Pathology of Cholera," be instructed to memorialize the Congress of the United States, requesting that honorable body to grant every necessary assistance that can or will promote the object for which the Committee has been appointed.

The Secretary read a letter from the Royal Medical and Chirurgical Society of London, England, thanking the American Medical Association for their present of the eighth volume of their *Transactions*. Accepted, and ordered to be placed on file.

On motion of Dr. WISTER, of Pennsylvania,

Resolved, That a committee of three be appointed by the President, to correspond with the proper officer of the Smithsonian Institute, inquiring into the possibility of procuring a chamber in that Institution for the use of this Association.

The President appointed as such committee—

Dr. CASPAR WISTER, Philadelphia, Pennsylvania,

" HALL, Washington, D. C.,

" JOHN NEILL, Philadelphia, Pennsylvania.

The President gave notice to the members of the Association, that receptions would be held at the Hon. HENRY LEDYARDS', Mrs. CANFIELD'S, Hon. CHAS. HOWARD'S, and at his own house, and that the ladies of the members of the Association were respectfully invited by the Hon. CHAS. HOWARD and lady, during the evening.

The Association then adjourned till 9 o'clock, Friday morning.

FRIDAY, *May* 9.

The Association met at 9 o'clock A. M. The President in the chair. The minutes of last meeting were read, corrected, and approved.

The following additional members, present by invitation, were reported: Dr. SAUNDERS, of Monroe, Michigan; Dr. R. K. RODGERS, of Suspension Bridge, New York. Accepted.

Dr. PALMER, of Illinois, presented the following resolution, by request:—

Resolved, That the name of RICHARD COOLIDGE, M. D., U. S. A., be substituted for that of Dr. FINLEY, on the Committee of "Medical Topography and Epidemics."

On motion, the resolution was adopted.

A letter was read from THOS. DILLARD, M. D., U. S. N., declining to serve on the Committee of "Medical Topography and Epidemics," saying that he could not act, in consequence of receiving no appointment as delegate to the Association from the Chief of Bureau of Medicine and Surgery.

On motion, the excuse was not accepted.

On motion of Dr. ATLEE, of Pennsylvania,

Resolved, That all voluntary communications hereafter presented to the Association, shall be referred to a special committee of —— to be appointed by the President on the first day of each annual meeting, whose duty it shall be to examine such communications, and report upon the propriety of the presentation and reference to the Committee of Publication.

The Committee appointed to prepare a suitable minute, having reference to the death of P. CLAIBORNE GOOCH, M. D., late Secretary of this Association, beg leave to report the following preamble and resolutions:—

Whereas, The exhibition of high courage and of self-sacrificing devotion to the good of others is ever honorable to a profession by whose members it is manifested, and worthy of their remembrance and emulation,

Resolved, That in the death of Dr. P. CLAIBORNE GOOCH, of Richmond, Virginia, who nobly volunteered his services during the pestilence at Norfolk, we recognize a loss to this Association, the profession, and to the country.

His arduous and successful labors as Secretary of this meeting at Charleston and Richmond, merited the regard of this Association.

The zeal, ability, and industry, manifested by him as founder and editor of the *Stethoscope*, the first medical periodical established in the State of Virginia, showed his devotion to the cause of medical progress and activity; and the manner of his death gave signal evidence that he was one of whom his country might well be proud.

Resolved, That a copy of these resolutions be transmitted, by the Secretary, to the relatives of Dr. GOOCH.

On motion, the preamble and resolutions were unanimously adopted.

On motion of Dr. PALMER, of Illinois,

Resolved, That the Committee of Registration of Marriages, &c., have leave to make a partial report, which is hereby referred to the Committee of Publication.

Dr. DENTON, of Michigan, offered the following resolution:—

Resolved, That a committee of three be appointed, whose duty it shall be to enlist some enterprising publishers, and aid in collecting and arranging material for an American Medical Directory.

On motion of Dr. WATSON, of New York, laid on the table.

Dr. LEIDY, of Pennsylvania, offered the following:—

Whereas, It is the object of this Association, in the award of prizes for communications on subjects appertaining to medical science, to encourage the progress of the latter, and as this result cannot be better entertained than through original investigation and discovery—

Resolved, That, hereafter, an annual prize of ——— dollars be awarded for the best memoir or essay founded on original investigations of the author, and, in case of no memoir or essay being presented worthy of such award, the prize money to be appropriated towards the expenses of publishing and illustrating such memoirs or essays as may be subsequently deemed worthy of an award.

On motion of Dr. PALMER,

Resolved, That the above resolutions, together with the suggestions in the report of the Committee on Prize Essays, as to whether any means can be devised to cause an increase of the number of essays presented, be referred to a special committee, to report at the next meeting of the Association.

Dr. LEIDY, of Pennsylvania,

" G. B. WOOD, of Pennsylvania,

" CHAS. D. MEIGS, of Pennsylvania,

were appointed as such committee.

Dr. H. H. CHILDS, of Pittsfield, Massachusetts, presented an invitation to the Association to join the Massachusetts Medical Society at its next annual meeting on the last Wednesday of May. Accepted.

Dr. ROBERT K. SMITH offered the following:—

Resolved, That a committee be appointed, to report to the next meeting of the American Medical Association, a classification of those diseases which involve a derangement of the mental manifestations. Carried.

Dr. SMITH was appointed Chairman of the Committee, with power to select his associates.

On motion of Dr. SMITH,

Resolved, That the amendment to the Constitution proposed by Dr. CHAS. HOOKER, at the meeting of the Association, in Philadelphia, 1855, be laid on the table until the next meeting of the Association, as Dr. HOOKER had left the city.

On motion of Dr. ATLEE,

Resolved, That the Committee of Publication be requested to transmit, annually, to the Epidemiological Society of London, England, a copy of our *Transactions*.

On motion of Dr. GUNN, of Michigan,

Resolved, That any new medical Institution not heretofore represented in this body, be required to transmit to the Secretary, with the credentials of its delegates, evidence of its existence, capacity, and good standing.

On motion of Dr. MCGUGIN, of Iowa,

Resolved, That a special committee be appointed, to report on the subject of "Stomatitis Materna."

Carried, and Dr. MCGUGIN appointed Chairman.

On motion of Dr. BAILEY, of Illinois, Dr. DAVIS was requested to continue his observations on the subject of the "Changes Pro-

duced in the Composition and Properties of Milk by Pregnancy and Menstruation. Also, the "Best Substitute for the Mother's Milk when Weaning becomes necessary before the Child is Eighteen Months Old," and report at the next meeting of the Association.

A communication was received from the Committee on Railroads, and read. On motion, the Committee was continued till next year. Carried.

On motion of Dr. ATLEE, the resolutions of Dr. PALMER, laid on the table, were referred to the Committee of Publication.

On motion of Dr. J. L. PHELPS, of New York,

Resolved, That with a view to harmonize, as far as may be, discrepancies, whether real or imaginary, that a committee of three be appointed to consider, examine, collate, and discuss, points admitting of doubtful import or construction, whether relating to our intellectual, moral, or physical natures, so far as they may be identified with the interests of medicine and the profession, and, also, as they may stand affected by any legal or organic limitations and provisions of our own compact, and hence elaborate and deduce such general principles and legitimate conclusions and practice as shall be warranted by a liberal, just, and comprehensive view of the whole subject, and report at the next annual meeting of the Association.

On motion, laid on the table.

On motion of Dr. ATLEE, of Pennsylvania, the thanks of the Association were returned to the officers of those railroads that had evinced a liberality in conveying delegates to and from the Association.

On motion of Dr. J. L. PHELPS, of New York,

Resolved, That the thanks of this Association are due, and are hereby tendered to the Fire Department of the city of Detroit, for the use of their large and commodious Hall, so amply furnishing to us accommodations for the convenient transaction of business.

Resolved, That the urbane deportment and elegant hospitalities of the profession and private individuals, as well as the polite attentions of citizens generally, demand of this Association a high appreciation of the cultivated manners of this city of the West, and which has tended greatly to enhance the pleasure of the session here of the delegates from abroad.

Dr. PALMER, of Illinois, offered the following resolution, which, on motion, was unanimously adopted:—

Resolved, That a vote of thanks be presented to the press of the city of Detroit, which has taken so much interest in reporting the proceedings of the Association.

On motion, the Association adjourned *sine die*.

WM. BRODIE, }
R. C. FOSTER, } *Secretaries.*

REPORT

OF

THE COMMITTEE OF PUBLICATION

AND OF

THE TREASURER.

REPORT OF THE COMMITTEE OF PUBLICATION.

THE Committee of Publication respectfully report:—

That immediately after the adjournment of the Association, at Philadelphia, contracts were made for the paper, printing and distribution of the *Transactions;* that the volume was put to press towards the end of May, and the first copies issued on the 10th of the following November.

In view of the large number of delegates present at the last meeting, it was thought advisable to increase the size of the edition of the eighth volume. Eleven hundred copies were accordingly printed, a large proportion of which have been disposed of.

The aggregate expense of printing, illustrating, and binding the volume, was nineteen hundred and twenty-two dollars seventy cents ($1,922 70), the details of which will be found in the Treasurer's report. The large amount of tabular matter (including rule and figure work), contained in the present volume, has made the amount of expenditure much greater than it would have been under other circumstances.

The distribution of the volume was effected, in every possible instance, by express, and where a number of volumes were required at any one point, they were sent in large packages, and the services of a resident member of the Association solicited to superintend their delivery. Where it was impossible to deliver by express, a circular was addressed to each member entitled to a copy, requesting that post-office stamps should be forwarded for the prepayment of postage, and the delivery, in these cases, was accomplished by mail.

The following gentlemen have rendered essential service to the Association; some in procuring subscriptions to the volume, and all by cordial co-operation in its distribution. Dr. C. HOOKER,

Conn.; Dr. ALDEN MARCH, Albany, N. Y.; Dr. J. L. ATLEE, Penna.; Dr. W. BRODIE, Mich.; Dr. C. B. GIBSON, Richmond, Va.; Dr. E. L. BEADLE, N. Y.; Dr. H. W. DESAUSSURE, S. C.; Dr. C. A. POPE, Mo.; Dr. D. H. STORER, Mass.; Dr. T. G. RICHARDSON, Ky.; Dr. J. MORAN, R. I.; Dr. J. MILLER, D. C.; Dr. F. E. B. HINTZE, Md.; Dr. L. P. BUSH, Del.; Dr. Z. PITCHER, Mich.; Dr. J. B. LINDSLEY, Tenn.

The Committee would be unjust as well as ungrateful, did they fail to record their acknowledgments to those gentlemen who so generously lightened their labors by the valuable assistance which they voluntarily rendered. They desire, also, to urge strongly upon the Association the importance of securing efficient co-operation in every State, by the appointment of committees whose duty it shall be to aid in procuring subscriptions and circulating the *Transactions*. The Committee would especially commend Connecticut for her services, as heretofore, in this particular.

Not a little embarrassment was experienced by your Committee in restoring to the list of permanent members the names of those who had been left off by order of the Association for non-payment of assessments. They have endeavored, however, in accordance with the resolution of the last session (vol. viii. p. 29), by careful comparison of the various lists, to supply all omissions.

The Committee were reluctantly obliged to omit from the *Transactions* two valuable reports on epidemic diseases. But as they had not been presented to the Association and acted on by that body, they felt that they had no alternative. The reports were those of Drs. L. H. Anderson, of Ala., and E. D. Fenner, of New Orleans.

The following resolution, passed at the last session, is again brought before the Association, with the recommendation that it be strictly enforced as an essential means of securing the early appearance of the forthcoming volume:—

"*Resolved*, That hereafter, beginning with the session of 1856, no report, or other paper, shall be entitled to publication in the volume for the year in which it shall be presented to the Association, unless it be placed in the hands of the Committee of Publication, on, or before, the 1st of June."

The following schedule exhibits the number of volumes of the *Transactions* on hand at the close of the last session, those disposed of during the year, and those now in the possession of the Association.

Vol. I. On hand at the date of last report .	46 copies.
Disposed of during the past year . . .	5
Remaining	41
Vol. II. On hand at date of last report . .	12
Received in exchange during past year . .	2
Disposed of during past year	5
Remaining	9
Vol. III. On hand at date of last report . .	31
Received in exchange during past year . .	1
Disposed of during past year . . .	5
Remaining	27
Vol. IV. On hand at date of last report . .	11
Received in exchange during past year . .	1
Disposed of during past year . . .	5
Remaining	7
Vol. V. On hand at date of last report . .	328
Disposed of during the year . . .	12
Remaining	316
Vol. VI. On hand at date of last report . .	105
Disposed of during the year	39
Remaining	66
Vol. VII. On hand at date of last report . .	184
Disposed of during the year	64
Remaining	120
Vol. VIII. Whole number published . .	1100
Disposed of to Members and Med. Journals at home and abroad	749
Remaining	351

Some of the leading journals abroad have expressed a strong desire to complete their sets. It rests with the Association to determine whether the missing numbers shall be supplied.

From the foregoing schedule it will be perceived that only seven complete sets of the *Transactions* are now in the possession of the Association. The Committee therefore renew the recommendation embraced in the resolution appended to the last report, that "no

copy of either of the eight volumes which is necessary to the complete sets now remaining shall be disposed of separately, or with any number of volumes short of a complete set."

All of which is respectfully submitted.

FRANCIS G. SMITH, JR., *Ch'n.*
CASPAR WISTER,
S. L. HOLLINGSWORTH,
FRANCIS WEST,
SAML. LEWIS,
H. F. ASKEW,
WM. BRODIE,
Committee of Publication.

REPORT OF THE TREASURER.

THE Treasurer respectfully reports:—

That the resolution passed at the meeting in St. Louis, requiring of delegates the prepayment of the yearly assessment, has proved, after a year's experience, of great advantage to the Association. By the operation of this rule the treasury is assured of the possession of a sum of money for the purposes of the Committee of Publication, upon which this Committee may with confidence draw, and likewise receive some indication therefrom as to what number of volumes of the *Transactions* will be required for the supply of members of the Association. That this supply is more restricted to the number of delegates present than would be the case if greater exertion were used throughout the country by members of the Association to procure subscribers to the volume, has been clearly demonstrated within the year, by the success of gentlemen who have interested themselves for its dissemination in certain localities. In order to promote a wider dissemination of the *Transactions* of this Association, and also to remove the uncertainty at present prevailing as to the conditions of membership, induced by the resolutions of the year 1854, making a yearly subscription to the *Transactions* obligatory, it is recommended that the Treasurer be requested, at an early date after the adjournment of the present meeting, to address a circular to each permanent member, announcing the abrogation of the above resolution, and the consequent restoration to membership of all those dropped from the published list of that year, advertising also the practicability of procuring back numbers of the *Transactions*, with information as to the cost at which the series of volumes may be rendered complete, or an entire set furnished by the Association.

CASPAR WISTER, *Treasurer.*

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CASPAR WISTER, *Treasurer.*

The American Medical Association in

DR.

1856.			
To cash paid Dr. Jno. L. Atlee, of Committee on Washington Monument Stone . . .		$498	70
" " " C. B. Norton for porterage, and packing vol. vii., in New York		8	00
" " " J. D. Trask, for prize essay . . .		100	00
" " " postage of Secretary		2	50
" " " D. C. Baxter, for engravings of vol. viii. .		72	75
" " " postage of Chairman of Publication Com.		4	09
" " " Thomas Sinclair & Co., for lithographs for vol. viii., less 5 per cent., $106 50 .		101	20
" " " T. K. & P. G. Collins, for printing and binding 1100 copies vol. viii., less 5 per cent., $1,840 79		1,748	75
" " " T. K. & P. G. Collins, for binding 25 copies vol. vi., and printing notices, less 5 per cent., $4 75		4	52
" " " H. Barnes, for distribution of vol. viii., and services as clerk		50	00
" " " T. K. & P. G. Collins, for printing notices		1	25
" " " Blanchard & Lea, for freight, porterage, boxes, &c., for vol. viii. . . .		34	99
" " " postage, envelops, and stationery of Treasurer		6	99
To balance		950	52
		$3,584	26

account with Caspar Wister, Treasurer.

		Cr.
1856.		
By cash	received from Dr. Isaac Wood, being the balance in the Treasury, April 30th, 1855 .	$1,015 26
" "	received from Dr. Isaac Wood, being the balance in the Treasury, of Prize Essay Fund, April 30, 1855	100 00
" "	received from assessment and the sale of *Transactions*	2,150 50
" "	received from Dr. E. L. Beadle, for the sale of *Transactions*	12 00
" "	received from Dr. Wm. Brodie, for the sale of *Transactions*	12 00
" "	received from Dr. A. March, for the sale of *Transactions*	24 00
" "	received from Messrs. Blanchard & Lea, for the sale of *Transactions*	102 50
" "	received from Dr. Charles Hooker, for the sale of *Transactions*	168 00
		$3,584 26

We, the undersigned, having examined the vouchers of the Treasurer, comparing them with his accounts, as rendered above, and having found them correct, have affixed our signatures in certification thereof.

FRANCIS G. SMITH, Jr.,
FRANCIS WEST,
SAML. LEWIS,
WM. BRODIE,
S. L. HOLLINGSWORTH,
H. F. ASKEW.

ADDRESS

OF

GEORGE B. WOOD,

PRESIDENT OF THE ASSOCIATION.

ADDRESS OF GEORGE B. WOOD,

PRESIDENT OF THE ASSOCIATION.

Custom demands, as one of the expiring duties of your presiding officer, that he should leave a legacy at least of good wishes, if not of something more valuable behind him. In compliance with this duty, I propose to say a few parting words, which, whatever else they may convey to you, will assuredly not interpret duly the sentiments of him who utters them, unless they make you sensible of his grateful and most kindly feelings towards his fellow members, and of his zealous interest in the great objects of our Association.

The present is a suitable occasion for taking a survey of the Association; for looking around towards the boundaries of its labors, interests, and duties, and noting whether something may not present itself in the view, which may profitably occupy, for a few minutes, our serious and earnest attention. Let us first throw a comparative glance from the present backward to the past. Perhaps by so doing we may be better prepared to look forward intelligently into the future.

Have the hopes with which the Association set out in its mission of self-imposed duty, been fulfilled? Has the loud call which it sent forth through the nation, startling the profession from its uneasy slumber, succeeded in awakening it thoroughly to a sense of its high responsibilities, and arousing a determined spirit of progress? Or has it died away in gradually diminishing echoes, leaving but a drowsy memory of that spirit-stirring appeal? Have the annual gatherings of the elect of the profession, their joint deliberations in council, their various legislation, the practical inquiry set on foot or encouraged, not omitting their exploits at the festal board, and kindly interchange of thought and sentiment in social assemblage; have all these been without fruit? Have they been

the mere course of a phantom ship through the ocean of human events, leaving no track in its passage, and bearing no freight onward to its destination?

Were we to listen to the clamors of opposition, the whisperings of discontent, or the murmured disappointment of an over-excited expectation, we might be disposed to give to these questions an unfavorable answer; to cease our struggles for an unattainable good; and with the wings of the spirit folded, and its head drooping, to submit in sadness to an inexorable destiny, chaining us in submission to all present evils, and jealous even of a glance towards the higher and the better.

But happily, such is not the voice of a clear and unbiassed judgment. It is true that the Association has not accomplished the whole of what it aimed at. Like all other young things, conscious of a stirring life within, and feeling no limits to its yet untried powers, it hoped and strove beyond the possible; it struck in its soaring flight against the iron will of circumstance, and for a time, at least, fell back, stunned though not crushed, into humbler aims. Yet, even as regards medical education, which is the main point of failure, its efforts have not been all thrown away. Some advance, however small, has, I think, been already made; and bread, moreover, has been cast upon the waters, to be found after many days.

But outside of this vexed subject, much, very much has been accomplished. I will not appeal to the ponderous volumes of our *Transactions*. They speak for themselves. To say that there is no chaff among their solid contents, would be to say what is neither now nor ever has been true of any large book, with one solitary exception. But I believe that all present will join me in the opinion, that one who searches these records, with a sincere and candid spirit, will find in them much that is good; much that may warrant the self-congratulation of the Association for having originated, or called it forth.

But, whatever credit may be given to these living witnesses of our labors, one fact is evident, that the medical mind has been aroused; that the spirit of improvement has breathed upon the masses of the profession, and everywhere scattered germs, which are now developing, and will probably hereafter continue to develop, even in a still higher ratio, into earnest efforts for self-culture, and general advancement.

Stagnation, in the moral as in the physical world, generates corruption. Agitation, though often in its extremes a cause of evil,

and sometimes of unspeakable present wretchedness, generally purifies in the end, and if restrained within due limits, is a source of unmixed good. The medical mind, anterior to the birth of this Association, was in a state of comparative inertia. In all the departments of the profession, the educational as well as the practical, material interests began to predominate. There was danger that the profession might sink to the level of a mere business. Noble aims; high aspirations; the general good; the spirit of self-sacrifice; these began to be looked on as wordy inflations. The great struggle seemed to be, in the teaching department, to gather pupils; in the practical, to gather patients; in both, to swell the pockets. Stagnation of the professional spirit was breeding noxious influence in its motionless depths. No wonder that quackery loomed upward, as regular medicine began to sink. There was danger that the public might be able to see little difference between them; and the fact is, that the line of demarcation was not very distinct, even to the professional eye. They ran into each other, at their extremes, by quite insensible shades.

But the Association arose, and a new spirit was awakened. Many had been watching this apparent abasement of the profession with sorrow; but they were powerless in their isolation. No sooner had the flag of the Association been given to the breeze, than they hastened to join its standard. From all quarters, and from the remotest bounds of the country, volunteers poured in to join this great crusade against the evils, which had been usurping the sacred places of the profession. The mass of medical society was moved to its very depths. Hundreds upon hundreds came forth from their sheltering privacy, and threw their souls into the grand movement which was to reconquer, to purify, and regenerate the prostrated glory of their calling. The feeble voice of opposition was heard for a moment; but was soon drowned in the overwhelming shouts of the masses, crying out, Onward! Onward! Even the advocates of the material principle, who could not raise their souls above the level of dollars and cents, found it expedient to chime in for a time with the almost universal voice; and to the enthusiastic it seemed as though a professional millennium was approaching. I need not follow the march of the crusade. I need not recall the varied experience which has but confirmed that of all other revolutionary uprisings, that, except under the influence of a power higher than human, which can regenerate the hearts of men, whatever temporary change may be made in the surface of things,

in mere form and arrangement, it is only by the slow working of time that radical and lasting reforms can be effected. Who ever beheld a great nation made by a written constitution? We have had paper republics as thick as the leaves in Vallombrosa; but where, and what are they now? To make a great and free nation, the people must have the principles of greatness and freedom implanted in their hearts. So is it with lesser Associations. It is vain to alter forms, unless the substance is altered too. The Association has discovered this truth. It no longer seeks to work miracles, but is content with following the methods of nature and providence. It has done a great thing in beginning the movement. It is doing what it can to further that movement, and to consolidate its results.

Who is there that has lived and observed through the last ten or fifteen years, who cannot see that our profession has been moving onward and upward since its great awakening; perhaps slowly, perhaps now and then halting, but on the whole advancing, and with an irresistible force, because it is that of the mass. It is not now a few leaders who are kindling by their own enthusiasm a feeble and temporary blaze of excitement in the multitude; dragging them forward as with cords by their own strong zeal and fiery spirit; it is the inborn soul which is animating the great body, and carrying it forward in its legitimate course.

Had the Association done nothing else, I will not say than originating, but even than aiding and concentrating this rising up of the profession, it would have performed a service entitling it to everlasting gratitude, and to an imperishable name in the medical annals of our country.

A great benefit conferred on the profession by the Association, was the preparation and adoption of a code of medical ethics. I need not say to *you*, that this code is merely an expression of the great principles of truth, justice, and honor, in their application to the relations of physicians to one another, their patients, and the public. It is the voice of wisdom and experience speaking from the past, and meets a ready response in the breast of every man possessed of a good heart, a sound judgment, and correct moral principle. Should any one find a repugnance to the observance of its rules rising up within him, let him for a moment reflect, whether this may not spring from some evil source in himself; whether it may not be the result rather of an unwillingness to make what he may deem a sacrifice at their suggestion, than of a real conviction

of their injustice or impropriety. Which is more likely to be true; the unbiassed and unselfish judgment of the wisest and most experienced in the profession, or an individual decision which may at least be suspected of a selfish basis, and of which no man, if his interests or feelings are in any degree involved, can say that it is quite pure; for no man can judge impartially in his own case. A becoming modesty would lead him to suspect that the fault might be in himself, and a becoming spirit to search into the secrets of his own heart for the root of the evil, and to pluck it out if discovered. I have no doubt that a full observance of these rules would tend, more than any one thing else, to maintain harmony in the profession, and to elevate it in the public esteem. It would render impossible those unseemly disputes, founded on petty jealousies, and supposed opposition of interests, which, probably beyond any other single cause, expose the profession to obloquy and ridicule. A copy of the Code should be placed in the hands of every young man about to enter upon the practice of medicine, with the urgent advice that he should make it the guide of his professional life; that he should not only regulate his conduct in conformity with its precepts, but should educate his heart into a real preference for them. Would it not be an object worthy of the attention of the Association to provide for such a distribution; at least, by the publication of a large edition of the Code, to put it in the power of individuals or societies, who might be disposed to engage in this work of beneficence, to do so with as little cost to themselves as possible? I do honestly believe that, to a young physician going forth into a life full of moral conflicts, the wearing of this ægis would be one of his surest defences; that, next to the holy Scriptures, and the grace of God, it would serve most effectually to guard him from evil.

Not one of the least advantages of the Association is that, representing as it may be said to do, the medical profession of the country, its voice, when nearly or quite unanimous, will be considered as that of the whole medical body, and thus have weight both in the community at large, and in the legislative councils of the nation. It is only thus that the profession can make their special opinions and wishes known and felt. I have been told that the representations of the Association had much weight in determining a satisfactory arrangement of the question respecting the relative rank of the Surgeons in the navy. It is to be presumed that the patriotic physician who brought before Congress the memorable measure for establishing a general inspection of imported drugs, was materially

aided in carrying it through by the approving voice of the profession, speaking in the memorial from this body. On another occasion, you were heard, through your resolutions, pleading in the Halls of Congress in favor of a great measure of honesty and justice, when you petitioned for an international copyright law between the United States and Great Britain; and, should such a law ever be passed, it will not be claiming too much for the Association to say that it will have contributed to that result. Your resolutions, from time to time, in advocacy of a system of registration of births, deaths, &c., have probably also added something to the mass of influence which has brought legislation to bear on this most important subject, though, it must be acknowledged, hitherto but very partially, and, with some honorable exceptions, ineffectually.

There is one other view of the beneficial influence of our great gatherings which I cannot pass unnoticed.

The effect of isolation is well known in breeding excessive self-respect, distrust of others, and narrow, selfish, and sectional views and feelings. Man is naturally gregarious; and it is only in association that his nature can receive its full development; that the seeds of the better qualities within him can be made to germinate, and the qualities themselves to grow up, under culture, into their just magnitude and proportions.

Our Association brings together many who would otherwise never meet, from sections remote from each other, and differing much in views, habits, and feelings. We come, partly, at least, for relaxation from the cares and toils of business, prepared and desirous to be pleased. Each one naturally, and without design, turns out the fairest side of his character, "his silver lining to the sun;" and all consequently make and receive favorable and kindly impressions. Each place selected for our meetings feels its character for hospitality involved in the reception of its guests, and every effort is made to extend all proper courtesies and kindnesses to the assembled representatives of the profession. In parting, therefore, we carry with us friendly remembrances of one another, and of the place of assemblage, to our several far separated homes. These remembrances serve as so many cords, not only to bind the members of the profession together in one harmonious whole, but also, intertwined with other similar agencies, to counteract the centrifugal tendencies of our political system, and to keep it moving onward, each part in its due place, in that majestic course, which, while shed-

ding beneficent influences throughout its own great circle, attracts the admiring and hopeful gaze of humanity everywhere.

Having thus hastily scanned the present and past of the Association, let us turn our thoughts briefly towards the future. A few words will convey all that I have to address to your attention.

It seems to me that experience should have taught us this one lesson; not to aim at once at sweeping changes; but, having determined what great objects are desirable, to keep these always in view, and, by the persevering use of such influences as may be at our command, securing one point in advance before hastening to another, to move on slowly but steadily to our ends. These must ever be the improvement of the profession itself, the advancement of medical science, and the promotion of the public good, so far as that may, in any degree, be connected with our special pursuit. Each of these three points requires a brief notice.

In the improvement of the profession, the Association has from its foundation recognized, as an essential element of success, a higher degree of qualification in those who are to become its members. But for the attainment of this object they can use no coercive measures. The only power they can exercise is that of opinion. Our only appeal is to the judgment and conscience of those concerned. But much may in time be done in this way. It is impossible that intelligent and honorable individuals, possessed of that share of conscientiousness which belongs to most men, and is certainly not deficient in our profession, should long resist such appeals, proceeding from a source so worthy of respect as this. Let us reiterate, from time to time, our convictions of the necessity for improved preparatory education, for a longer devotion to the proper studies of the profession, for a junction of clinical with didactic instruction, and finally for something more than a mere nominal examination before admission to the honor of the doctorate, or the privileges of a license to practice; points which have ever been insisted on by the Association; let us, I say, reiterate these convictions; and like slowly dropping water, they will at length, however gradually, wear their way through the hardest incrustation of prejudice, interest, indolence, or indifference, and reach the conscience with irresistible effect. While bringing to bear upon this resistance, the considerations of reason, duty, honor, and even an enlightened self-interest, we must carefully avoid all violence of procedure, as likely only to add the hostility of passion to other opposing influences. By this course universal opinion

will be gradually conciliated; and interest itself will find its own ends best promoted by compliance with the general will. Already some advance has been gained in this direction; and the Association, by perseverance, may yet see all its reasonable wishes accomplished.

In relation to other measures for elevating the character and increasing the efficiency of the profession, there appears to me nothing more at present for the Association to do, than to go on as it has begun. Its continued existence alone is a great good; for it is annually bringing large numbers, simply through membership in its body, to participate in its feelings, and to acknowledge its obligations. Let us then maintain unshrinkingly the standard of professional honor and morals that we have erected, and decline association with those who will not recognize that standard, or, having recognized, abandon it. Let us adhere unswervingly to the line which has been drawn between regular and irregular medicine, and treat the practitioners of the latter with the silent disregard they merit. This is the only course for the regular practitioner. To wage a war of words with quackery, is to do what it most delights in. It would be to contend, under the government of honor and principle, with antagonists who acknowledge no such restraints. In our private intercourse with friends and patients, we may explain the grounds of difference between ourselves and the irregulars, may demonstrate the absurdity of their pretensions, the danger of their practice, and the iniquity of their conduct; in short, may endeavor to enlighten wherever light is acceptable, or can penetrate. We may even, if the public interest seem to require it, put forth refutations of false doctrine and assertion, and exposure of subterfuge, trickery, and imposture; but with the irregulars themselves we should enter into no relation, whether of friendship or hostility. I do not say that there may not be honorable and honest, though ignorant or bewildered men among them. But we cannot discriminate. With the presumed advantages of their association, they must be content to take also the disgrace.

There is a point to which I would call the attention of the members of the Association individually. We have been called *Allopathists*, in contradistinction to a sect of irregular practitioners who have taken to themselves the title of *Homœopathists;* the latter term signifying that its professors treat disease by influences similar in their effects to the disease itself; the former that *other*, and of course dissimilar influences are used. It must be remembered, that the designation was not adopted by ourselves, but conferred upon us

by Hahnemann and his followers. The intention was obvious. It was to place the regular profession, and their own scheme, upon a similar basis. They practised on one principle, we on a different and somewhat opposite principle. They graciously allowed that our principle was not altogether ineffective; that we did sometimes cure our patients; but theirs was sounder in theory, and more successful in practice. Now, by recognizing the name, we necessarily recognize the principle also, and thus put ourselves in a false position. In deciding between them and us, the ignorant masses think they are deciding between two systems, neither of which they understand, but of which they must judge, upon the grounds of relative success. Diseases often get well of themselves, if left alone. The genuine homœopathist leaves them alone, and they often consequently terminate in recovery. This success is magnified by methods well understood; and multitudes are thus led astray, especially among the delicate and refined, who abominate the taste of medicine themselves, and are equally averse to the task of forcing it down the reluctant throats of their children. But we are *not* allopathists. The regular practice of medicine is based on no such dogma, and no exclusive dogma whatever. We profess to be intelligent men, who seek knowledge, in reference to the cure of disease, wherever we can find it, and, in our search, are bound by no other limits than those of truth and honor. We should not hesitate to receive it from the homœopathists, had they any to offer. We would pick it up from the filthiest common-sewer of quackery; for like the diamond, it has this excellent quality, that no surrounding filth defiles it, and it comes out pure and sparkling, even from the kennel. This is the light in which the medical profession should present itself to the community. We are men who have sought in every possible way to qualify ourselves for the care of their health. We present them, in our diplomas, the evidence that we have gained sufficient knowledge to be trusted with this great charge; and we stand pledged before them to extend our knowledge and increase our skill, as far as may lie in our power. Membership in our honorable profession is the proof we offer that we are no false pretenders, no interested deceivers; but upright men, intent on the performance of our professional duties. This the people can understand. But when we designate ourselves as *allopathists*, they may well ask, in what are you better than any other medical sect, than the *homœopathists*, the *hydropathists*, the *Thomsonians*, the *eclectics*? Let us discard, therefore, the false epithet. Let us not only never employ

it ourselves, but show that, when applied to us by others, it is inappropriate and offensive, and that the use of it in future would be contrary to gentlemanly courtesy, and the proprieties of cultivated society. I say again, we are not *allopathists;* we are simply *regular practitioners of medicine*, claiming to be honest and honorable—in other words, to be gentlemen.

The efficiency of our profession is to be increased not only by increasing its qualifications, but also by all upright measures calculated to win the public confidence, and thus widen the field of our operations. In this respect, I do not know that the Association can do better than to persevere as it has begun; and, by the propriety and dignity with which it conducts its own proceedings, to show to the world the high influences under which the profession acts, and demonstrate that it possesses those qualities of self-government, so useful to the medical practitioner, and so characteristic of the gentleman in all his relations.

The improvement of the *science* of medicine has always been a favorite object of the Association. The appointment of committees to investigate and report on certain stated subjects, the reception of voluntary communications, the offering of prizes to competing contributors, and the publication of our *Transactions* annually, are the means employed for this purpose; and I have nothing better to suggest.

The remaining point for consideration, is the promotion of the public good. Happily, such is the nature of our profession, that the more we improve ourselves, the better do we fulfil this great duty. But there is something else to be done. There are certain great interests of the community, relating to their health, of which medical men are the only good judges, and the various influences affecting which they only can duly appreciate. Upon these points it is our duty to be ever on the watch, and not only, like faithful sentinels, to give notice of danger, but, like heaven-appointed agents, as we are, to use our best efforts and influence to prevent or remove it, and, in every practicable way, to guard the public health.

To the establishment of a general system of registration throughout the country, our attention has already been given. We should not relax our efforts, until the great end has been accomplished.

There is another subject deserving of our most serious consideration. You are all aware what advances have recently been made by the smallpox in many parts of our country. Thousands are perishing annually, for whose deaths we are, as a profession, in

some degree accountable. There is no occasion for this mortality. Vaccination and revaccination, duly performed, and under proper circumstances, are, I will not say an absolutely certain, but a very nearly certain safeguard. I have never known of death from smallpox, after an efficient revaccination; and only one instance of the occurrence of varioloid. But the profession and the community have both been too careless upon this point. Food for the pestilence has been allowed to accumulate; and it has been rioting with fearful results in many parts of our country. The profession should rouse itself from this apathy, and warn the community everywhere of the danger, while offering them the means of security. We may be accused of self-interest in urging this measure of precaution; as our own instrumentality may be necessary, and must be compensated where the means exist. But a moment's reflection must convince the most stupid that it would be much more to our pecuniary interest to attend a protracted case of smallpox, than to perform a trifling operation, which is to prevent it. There are, however, many occasions, in which it is necessary to do our duty at the risk of obloquy; and this is one.

But perhaps I have been somewhat unjust to the profession. The people have, in many places, and probably, in some degree, in almost all, chosen other guardians of their health, and rejected our offered aid. It has happened to me to become acquainted with one neighborhood, in which smallpox has recently prevailed; but not a single case occurred within the circuit of the regular physician's practice. Those families only suffered who had intrusted the care of their health to an empiric, who, for aught I know, may have been ignorant alike of smallpox and of vaccination. It is highly probable that many of those who now hear me could give a similar account of their own neighborhoods. The public should take this subject into their hands. Provision should be made, with legislative sanction, for universal vaccination. If the evil were confined exclusively to the negligent individual, the public might possibly have no right to interfere. But whole communities suffer, and government may and ought to step in for their protection. A man is prohibited by law from setting fire to his own house, because a neighbor's may suffer. Which is the greater evil, that our house should burn, or our families perish with smallpox? It might be impossible in this country to establish a system of compulsory vaccination; but legislation might go far towards attaining the same end without this obnoxious feature. Time, however, does

not permit me to follow this interesting subject in all its ramifications. I must content myself with having introduced it to your notice. If the profession can do nothing more, they can at least raise a warning voice everywhere; and this will be doing much.

I must close with begging you to excuse the length into which I have been drawn in the discussion of the important points that have engaged our attention. I intended to be very brief; but few men, when they have taken their pen in hand, can say to the flowing tide of their thoughts, "thus far shalt thou go, and no further." Allow me, in a few parting words, to thank you warmly for your attention, and to express the hope that our labors, during the present session, may tend to confirm the good that has been done, and to carry us still further onward in the great road of progress; so that, hereafter, the meeting at Detroit may be remembered as one, at which we may all be gratified and proud to have assisted.

REPORT

ON

DEFORMITIES AFTER FRACTURES.

BY FRANK HASTINGS HAMILTON.

PART SECOND.

"DISTORTION, or ill conformation of the parts, proceeds either from the neglect of the Chirurgeon, when he makes less extension, joining together or binding than he ought to do; or it is the fault of the Patient, when he stirs the broken part before the Callus is grown strong, or stands upon it; or else it is the fault in the fracture."—SCULTETUS.

PREFACE.

THE second part of my report on *Deformities after Fractures* includes the consideration of fractures of the scapula, arm, forearm, and hand. It was my original intention to have completed the whole subject in a single paper, but I had then no proper idea of the amount of labor which was before me. Instead of one report, I shall be obliged to make three, for I have not yet considered fractures of the body and lower extremities.

It is so natural for one to overestimate the importance of any work upon which he has been for a time especially engaged, that I distrust my own judgment in reference to the propriety of continuing the report beyond this year; and I beg that you will indicate to me frankly your desires upon this subject. In the mean time, whatever may be your commands, I am preparing to publish, on my own account, a *Treatise on Fractures and Dislocations;* and, as I shall wish to make use of the material which is already contributed by me to your *Transactions*, and which has become your property, I shall be obliged to ask your consent to such a diversion of your rights.

CHAPTER VI.

SCAPULA.

THE following are the only cases of fracture of this bone which have come under my especial observation. In my visits to hospitals in this country and abroad, I have occasionally seen other examples, three or four of which I can call to mind; but I did not make at the time any careful examination of them, and I am not prepared to record either their history or their results.

Body.

CASE 1. *Fracture and union without deformity or maiming.*

Willard Vaname, aged 55, fell on his back upon the sidewalk, breaking the scapula a little below the spine. The soft parts were swollen and tender, and prevented an examination sufficiently accurate to determine whether the fragments were displaced; nor could I ascertain the direction of the fracture. Its existence, however, was rendered certain by an occasional distinct crepitus.

I applied a broad roller about the arm and chest, and directed him to remain quiet a few days. Recovery was complete within three months. No muscular anchylosis.

Acromion Process.

CASE 2. *Fracture with ligamentous union. Functions of the arm not impaired.*

Samuel Denon Knight, of Buffalo, aged 28 years, fell into the hold of a vessel, striking upon his head and shoulder. He was for a time insensible. Drs. Flint, Mixer, and myself in attendance. The next day we discovered the fracture of the acromion. It was broken transversely about three-quarters of an inch from the extremity. The fragment was only slightly displaced, and motion, with crepitus, was distinct. He raised his arm to his head with some difficulty.

We adopted no treatment. Six months after the accident, I found him with the perfect use of his arm and shoulder. The fragment was united, but slightly depressed.

Coracoid Process.

CASE 3. *Fracture and no union at the end of three months; complicated with unreduced dislocation of the clavicle at its scapular extremity.*

John Wood, Jr., of Lancaster, Erie County, was struck by a board falling edgewise upon his shoulder, dislocating the acromial end of the clavicle, and at the same moment striking upon and breaking the coracoid process.

The case was treated with a sling, axillary cushion, and roller. At the end of three months and five days, I found the apparatus still applied. The clavicle was uplifted from its socket, and the fragment of the coracoid process could be distinctly felt moving forwards or backwards whenever the humerus was moved in these directions.

Feb'y, 1856. The fragment remains displaced, with the clavicle also, and the functions of the arm are not impaired.

Acromion Process. Cabinet Specimens.

Specimen 1. A boiled specimen, taken from an adult skeleton. The process is separated obliquely, at an angle of 45°, six lines from its extremity, and not united. The adjacent surfaces are smooth and covered with compact tissue, as in pseudo-arthrosis. There is no appearance of ensheathing callus, except a very slight crest along the margin of the fracture. The history of the specimen is not known. (The property of the Wistar and Horner Museum, University of Pennsylvania, Philadelphia.)

Specimen 2. A boiled specimen. Adult. Separated nearly transversely six lines from extremity, and not united. Adjacent surfaces resemble specimen No. 1. History not known. (Wistar and Horner Museum.)

Specimen 3. A scraped specimen. Adult. Separated nearly transversely at about one inch and a quarter from the end. Closely united by ligament, and fragment not displaced. No ensheathing callus. These conditions were noticed before the specimen became

dry, at which time there was distinct motion between the fragments. (Museum of the Massachusetts Medical College, Boston. No. 1369.)

Specimen 4. Dried. Adult. Separated in a direction slightly oblique, so that measuring on one side the fragment is twelve lines in length and on the opposite fifteen lines. It is closely united by ligament and without displacement. (Mass. Med. Col. No. 1370.)

Specimen 5. A macerated specimen. Adult. The process is separated about one inch from its end, nearly transversely, and united by ligament without displacement. No ensheathing callus. Between the fragments there was "almost a synovial cavity." (Mass. Med. Col. No. 1371.)

Specimen 6. This is probably the mate of No. 5, and resembles it in all points except that ossification seems to have partly occurred between the fragment and the body of the scapula, but by accidental violence to the specimen, the process has been broken off at or very near the line of ossification. (Mass. Med. Col. No. 1372.)

Specimen 7. Dried specimen from an adult. Separated transversely near its middle, and united by a ligament of about two lines in length. No displacement of the fragment. No ensheathing callus. (Museum of Charles Gibson, Richmond, Va.)

Specimen 8. Dried. Adult. Separation transverse, about one inch and a quarter from the end. Not united. (Charles Gibson.)

Specimen 9. Adult male, æt. 40, a stout laborer. He was struck by a "powder blast," breaking at the same time his humerus, the lower jaw, and the base of the skull. The periosteum was not broken upon its upper surface, so that no displacement occurred. The fragment could be turned up and back as on a hinge. The patient survived the accident three weeks. (Stephen Smith, one of the Surgeons to Bellevue Hosp., N. Y.)

Coracoid Process. Cabinet Specimens.

Specimen 1. Separated one inch from extremity. Line of separation somewhat irregular. No callus. Fragment suspended by a dried tissue continuous with the periosteum. The acromion process has not yet become united by bone. The scapula is large, and evidently belongs to an adult. (John Neill, Philadelphia.)

Specimen 2. A dried specimen. Adult. Broken obliquely near the end. United by ligamentous or fibrous tissue, of one line and

a half in length, in a manner similar to specimen No. 1. The fragment is displaced a little forwards, as well as downwards. (Charles Gibson, Richmond, Va.)

Specimen 3. This is a dislocation of the head of the humerus forwards under the clavicle with fracture of the coracoid process. The head and neck of the humerus lay against the thoracic surface of the neck and belly of the scapula, and are firmly united to the scapula by an abundant ossific deposit. (Reuben D. Mussey, Cincinnati, Ohio.)

Specimen 4. "No. 453, labelled 'Fracture of coracoid process,' and whether by Dr. Warren, the founder of the museum, or by some former owner of the specimen, I cannot say; its history being unknown. There is a fracture not merely of the entire process from the body of the bone, but it encroaches somewhat upon the body and the glenoid cavity. The fracture was quite recent, as it would appear from an examination of the fractured surface generally, and also from the edges, where it encroaches upon the glenoid cavity. Commencing near the margin of this fracture, and extending outwards upon the scapula, there appears evidently to have been an old fracture, which has united by bone. This fracture extends horizontally along the body of the bone for nearly two inches, then turns upwards at a right angle and extends about two-thirds of an inch in that direction. Upon the inner surface, the line of the old fracture does not quite reach the recent one apparently, though I presume that it extended rather further in that direction in the recent state than it appears to now. Upon this inner surface no new bone is thrown out along the line of the fracture; but, on the other hand, this line is for the most part indicated by a very narrow and superficial groove. Upon the outer or dorsal surface, there is a deposit of new bone along the line of the fracture, quite small in amount; but, on approaching the neck of the bone, this deposit increases very considerably in amount, and becomes quite irregular. On examination of the detached coracoid process itself, there is distinct evidence of an old fracture that must have involved its very base towards the body of the bone, the surface adjacent to the fracture being rough from inflammatory deposit. I have given these details because it is a complicated case; and, to give a general idea of it, as it appears to me, I should say that there might have been a fracture of the bone some time within a year before the death of the individual—a fracture involving the base of the coracoid process; this fracture had united by bone, and just before

death the whole process had been broken off, and so completely as to involve to a small extent the glenoid cavity." (Mass. Med. Col.; reported by J. B. S. Jackson, Boston.)

REMARKS.

Fractures of the scapula are exceedingly rare, and the observations recorded by myself are too few to enable me to draw any valuable conclusions. I have sought, therefore, to supply in some measure, the deficiency in this portion of my report by describing briefly such specimens of these fractures as may be found in my own collection, or in the collections of other American surgeons.

Cabinet specimens of fractures of the body and angle of the scapula being more frequently met with than specimens of fractures of either of the processes, or of the neck, I have omitted to collect and record them. I have, however, furnished the following epitome of the opinions and practice of surgeons, relating to these latter accidents, as a *résumé* of what is at present known of them, both in relation to prognosis and treatment; a mode of considering this subject which, although it might scarcely be admissible in a systematic treatise, seems to me not inappropriate in a report, the object of which is rather to collect from every source facts, opinions and references, which others may hereafter render available.

If the scapula "be broke in several pieces which are not likely to unite, incision is to be made, and the loose pieces are to be taken out, leaving the rest to nature." "If the scapula be broke near the joint, it is for the most part incurable." (*System of Chirurgery*, by Richard Boulton, p. 324. London, 1713.)

Where the patient is not so fat or so muscular as to render it impracticable, the fingers must be thrust underneath, so as to elevate the depressed fragments, "which having replaced, with suitable bolstering and deligation, you are, as much as possible, to keep it up." A careful regimen is to be enjoined, with rest and proper therapeutics, "and when he has done this, as becomes him, I see not any injustice that he should be paid for a cure, in which, if the work succeed, *Nature* rather than *Art* had the chiefest hand." (*Art of Surgery*, by Daniel Turner, vol. ii. p. 260. London ed., 1742.)

Elevate the head and shoulders, to relax the muscles of the back, and at the same time support the humerus so as to relax the deltoid. Retain the arm and shoulder in this position by suitable rollers. (*System of Surgery*, by Benjamin Bell, p. 478. 3d Philad'a ed., 1806.)

When the body is broken, "it is merely necessary to fix the arm to the side by means of a bandage, which includes the arm from the shoulder to the elbow." When the inferior angle is broken off the arm is to be pushed "inward, downward, and forward, where it is to be kept by a roller. The fragment is also to be kept backward as much as possible, with compresses and a roller. The arm is to be supported in a sling." (*On Fractures*, by Joseph Amesbury, vol. ii. p. 534. London ed., 1831.)

"It is sufficient to restrain motion; and this is effected by passing a bandage round the chest, over the scapula, and round the arm." (*Elements of Surgery*, by Robert Liston, p. 470. Philad'a ed., 1837.)

The elbow is to be lifted by a sling, and the arm and body are to be swathed with a broad roller. If the lower portion is disposed to become displaced, it may be supported by a pad. "It is seldom, however, that much advantage can be gained by this." * * * "Little harm results if the fractured portions unite in the position into which they are driven at the time of the accident. * * * The free use of the shoulder-joint, however, is not recovered till some time after." (*Treatise on Fractures*, by Edward F. Lonsdale, p. 191. London ed., 1838.)

"When the lower angle of the scapula is broken off the humerus may be brought forward across the chest, and the hand confined upon the opposite shoulder." "This position is adopted abroad; but, in this country, when any part of the body of the scapula is fractured, we merely apply the spica bandage." Mr. Cooper regards this bandage as "of little or no use," and speaks of the sling which is employed with it, as "the efficient part of the apparatus." (*First Lines of Surgery*, by Samuel Cooper, vol. ii. p. 327. New York ed., 1844.)

A simple roller to keep the arm against the body, and a sling. (*Note to Chelius*, p. 602.)

A sling, with a bandage to confine the arm to the body, or with Desault's apparatus. (*Operative Surgery*, by Frederick C. Skey, p. 157. Philad'a ed., 1851.)

When the dorsum is broken Mr. B. Cooper employs a long roller which is made to cover the arm and secure it to the chest; but when the fracture is at the inferior angle, he recommends that the arm be carried across the chest. (*Surgery*, by Bransby B. Cooper, p. 227. Philad'a ed., 1852.)

"A body bandage." (*Surgery*, by John Erichsen, p. 206. Amer. ed., 1854.)

"A broad flannel bandage, or riding belt, should be put around the body, and the arm bound to the side." "It is with difficulty retained *in situ*." (*Practical Surgery*, by John Lizars, p. 132. 2d Edinburgh ed., 1847.)

"It is sufficient to restrain motion, by wearing the arm in a sling, and by having a broad flannel bandage passed tightly over the chest, including the fractured bone." (*Practice of Surgery*, by James Miller, p. 311. Philad'a ed., 1853.)

When the angle is broken off, or even though the fracture be considerably above the angle, if it is complete and transverse, it will be necessary to place one compress in front of the lower fragment, and one behind the upper, and then having pressed the arm downward, forward, and inward, to secure it with a roller, &c. If the body is broken otherwise, it will be sufficient to put the arm in a sling and to secure the arm to the body with a roller. (*System of Surgery*, by William Pirrie, p. 146. Philad'a ed., 1852.)

Gorter recommends in all fractures, whether of the body, processes, or neck, that in order to accomplish the reduction, the elbow shall be carried from the body to relax the deltoid, and that the arm be then suspended and kept at rest in a sling. "*In restitutione attollendum brachium, ut Deltoides musculus sit laxus, dum digitis Chirurgi reponatur fractura. Post repositionem diu non debet aeger conari elevare brachium, sed gerere debet brachium mitella admodum sustentatum.*" (*Chirurgia Repurgata, auc. Johannis de Gorter.* Lugduni Batavorum, p. 80. 1742.)

Confinement of the arm to the side of the body, with a conical pad in the axilla, the apex of which should correspond to the axilla; the elbow lifted by a sling, or bandage, or both; a figure of 8 bandage upon the shoulder. Where the fracture is transverse and considerably above the angle, the hand may rest, if the patient can endure it, upon the sound shoulder. "If the fracture is near the angle, the cure is always effected with some deformity; but which does not interfere with the motions of the arm." (*Chelius' Surgery*, vol. i. p. 601. American ed., 1847.)

In fractures of the body apply a simple bandage to confine the arm to the side of the body. In fractures of the angle the upper fragment is to be carried backward and downward by bringing the elbow forward and upward; and the whole is to be secured

by a long roller. (*Operative Surgery*, by A. Tavernier, p. 378. Philad'a ed., 1829.)

Rejecting all the complicated forms of apparatus, which he believes to have been proved inefficient, M. Nélaton remarks: "In truth we are forced to acknowledge that we have not any means to act upon the fragments; all that we can do is to maintain their immobility, and upon this occasion *I will repeat what I said when treating of fractures of the clavicle; all our retentive means being equally insufficient, the best will be that which will cause the least pain;* a simple sling, which will embrace the elbow, the arm, and the forearm, will then suffice. I must, however, give the preference to the bandage of M. Mayor, because it maintains the shoulder more firm." (*Elémens de Pathologie Chirurgicale*, par M. Nélaton, tom. premier, p. 723. Paris ed., 1844.)

Mayor employs the same apparatus which is recommended by him for fractured or dislocated clavicle, namely, a sling with two broad shoulder-straps, which are made to rest respectively upon the two shoulders; the elbow being carried forward across the body. (*Nouveau Système de Deligation Chirurgicale*, par Matthias Mayor de Lausanne. Troisième éd., p. 396. Paris, 1838.) See also Figs. 23 and 24, Plate 3.

"With all these precautions we can easily determine the existence of a fracture; but to know whether it is transverse or oblique, simple or multiple, is another thing. Often, indeed, when the displacement is nothing, or very inconsiderable, crepitation will declare a fracture to which the touch cannot assign its place; and, finally, a fracture without displacement, and without crepitation, will be almost inevitably unrecognized.

"It is fortunate, then, that in these cases the mistake is without importance, and the prognosis is scarcely more grave in fractures which are accompanied with the most striking displacement. B. Bell affirms that they determine, very frequently, in the movements of the arm a permanent stiffness;[1] but for myself, I have seen nothing of this kind, and I have not even remarked an appreciable constraint in the movements with the subjects whom I have seen.

"Fractures without displacement require nothing but repose, and

[1] "It is always difficult to cure, and induces commonly a permanently stiff and unwieldy state of the corresponding arm."—*System of Surgery*, by Benjamin Bell, p. 478, 3d Philad'a ed.

it is sufficient to hold the arm snug against the trunk with a body-bandage and a sling.

"When there exists displacement, the reduction has been effected in various ways. Pierre d'Argelata places a ball under the arm and brings again the elbow against the ribs. J. L. Petit directed that the arm of the patient should be lifted until the fold of the elbow was opposite the nose; and, while an assistant maintained it in this position, the surgeon should adjust the fragments as well as possible. B. Bell recommended to elevate the head and the shoulders to relax the muscles of the back. Heister drew the arm forward;[1] Desault, for fractures of the inferior angle, carried the arm before the chest, holding it a little removed from the body, while the hand of the injured side was placed upon the extremity of the sound shoulder.[2]

"Surgeons are not much better agreed as to the apparel to be employed. Paulus of Ægineta treated these fractures as those of the clavicle, recommending that the patient should be kept reclining upon the sound side. Albucasis applied upon the scapula a sort of *etoupade*, above which again are placed compresses, and splints of wood or of leather. Desault employed a wedge-shaped cushion, of which the apex corresponded to the axilla, and the base to the chest, in order to furnish a *point d'appui* for the arm; the whole supported by a bandage six or seven ells in length, of which the first turn was intended to fix the hand of the injured side upon the sound shoulder. Boyer,[3] without having any regard to the displacement, occupied himself in maintaining the immobility of the bone; and, therefore, by appropriate turns of the bandage he secured the arm closely to the side of the body, carrying the elbow at the same time a little forward.

[1] Heister adds, moreover, that we ought to apply proper compresses and slips of pasteboard wet "*cum spiritu vini vel oxycrato*," and firmly bound on with the stellate or four-headed bandage.—*Institutiones Chirurgical de D. Laurentii Hiesteri.* Pars Prima, p. 94. Ed. Amstelaedami, 1739.

[2] Treatise on Fractures, Luxations, &c., by P. J. Desault, p. 64. Philad'a ed., 1805.

[3] For vertical fractures, or transverse and through any part considerably above the lower angle, Desault's apparatus without the axillary cushion. To place the hand upon the opposite shoulder, is, however, "unnatural and fatiguing." In fracture of the inferior angle, "the arm is to be pushed inward, downward and forward, the forearm being half bent." The arm is to be retained in this position by a body-bandage, seven yards long; the lower fragment is to be supported by a compress and an additional roller, with a sling.—*Boyer on the Bones*, p. 70. Philad'a ed., 1805.

"Among such a diversity of practice, which shall the surgeon choose? Shall he attempt the reduction, and have we the means to accomplish it?

"The three indications to fulfil will be to carry the inferior fragment backward and inward, the superior forward and outward, and lastly, to correct the overriding. The inferior fragment seems to be drawn away by the teres major; it is necessary, then, in order to relax this muscle, to approach the arm to the trunk, and even to incline it a little backward. The superior fragment appears to be under the predominating influence of the rhomboid, which is relaxed by carrying the shoulder upward and backward. But as to the overriding, I do not see any means by which it can be overcome.

"Position alone will not suffice to correct the two first displacements; it will be found necessary to employ also adjustment with the hands, and further, the retentive apparatus must combine at the same time: *First*, means capable of holding the shoulder upward and backward, with the elbow near the body; and upon this point the reader may consult what we have said upon the subject of this indication when speaking of fractures of the clavicle. *Second*, of means suitable to replace the pressure of the hands—a compress upon the superior fragment, to press it forward against the other—graduated compresses beneath the same to hold it outward, and upon the outer side of the inferior fragment to hold it inward.

"Such, at least, are the means which a study of the actual displacements, and their most probable explanations, would seem to indicate; but here, as in many other cases, nature makes light of our theories; and for myself I confess that in the few fractures of this kind that I have had occasion to treat, I have not been able, by any of the means which I have indicated, to reduce the displacements, much less to maintain the reduction. Indeed, I must say that the positions which seem the most rational, sometimes increased the displacement, which was again diminished by other attitudes, variable for each subject. If, then, a surgeon shall ask advice with regard to the reduction, the only course which experience authorizes me to give to him, will be to try every possible attitude, until he has found the best, and then to maintain this position as long as may be necessary for consolidation.

"But in the major part of these fractures, such excessive care is not demanded; and in others, the reduction, often so impossible to accomplish, is of no very great importance, and I content myself

with holding the arm up with an ordinary sling, while it is kept snugly against the trunk with a body-bandage." (*Traité des Fractures et des Luxations*, par L. F. Malgaigne. Paris ed., tom. i. pp. 503–5.)

In cases of fracture of the lower angle, a thick compress is to be placed in front of the lower fragment, and there retained by an additional roller or a sling. * * * "It is hardly possible to restore the fragment to its former position." * * * Yet "they may be made to approximate so closely as to leave little or no deformity." "Sometimes the patient recovers sooner when confined to bed during the whole treatment." (*Surgery*, by Wm. Gibson, vol. i. p. 278. Philad'a ed., 1841.)

A broad compress and a wide roller around the chest, with the arm in a sling and confined to the body. If the inferior angle is broken, the arm should be carried backwards, and confined by a broad roller with compresses, so applied as to support both fragments of the scapula. The whole arm is to be sustained by a sling. (*Minor Surgery*, by F. W. Sargent, p. 153. Philad'a ed., 1848.)

In addition to the remarks made by these various writers, I find it only necessary to say that occasionally these accidents are so severe as to determine suppuration, and even necrosis of the bone, requiring, therefore, more or less deviation from the rules of treatment which have been suggested.

I have been unable to find any other example of incomplete fracture of the scapula than the one mentioned by M. Malgaigne. I have, therefore, had executed upon stone, a drawing of a specimen contained in my own cabinet (Pl. 1, Fig. 1). The bone was presented to me by Dr. N. C. Powers, of Syracuse, and belongs to the skeleton of the Oneida Indian, "Nimham," who was a great fighter, and who died when about 45 years years old, in consequence of severe injuries received in a street brawl; but his death did not occur until four or five months after the receipt of the injuries.

In addition to this fracture of the right scapula, five of his ribs were broken, and both legs, all of which, except the scapula, had united completely by intermediate and ensheathing callus. He was under the care of Dr. Morrison, of Oneida Castle.

The lithograph has been drawn with great fidelity, by Charles E. Lewis, lithographer, of this city.

The scapula (see engraving) is broken nearly transversely, commencing upon the posterior margin at a point about three-quarters of an inch below the spine, and extending across the body of the

bone one inch and three-quarters, in a direction inclining a little upward, irregularly denticulate and without comminution. The fragments are in exact apposition, and, throughout most of their extent, in immediate contact. They are, however, not consolidated at any point, but upon either side of the fissure there is a ridge of ensheathing callus, of from one to three or four lines in breadth, and of half a line or less in thickness along the broken margin, from which point it subsides gradually to the level of the sound bone. The same is observed upon the inner as well as upon the outer surface of the scapula. This callus has assumed the character of complete bone, but it is more light and spongy than the natural tissue, and the outer surface has not yet become lamellated. Its blood-canals and bone-cells open everywhere upon the surface.

Directly over the fracture, and between its opposing edges, no callus exists, but as the bone had lain some time in the earth before it was exhumed, it is probable that a less completely organized intermediate callus had occupied this space, and that, owing to the less proportion of earthy matter which it contained, it had become decomposed and had been removed.

One may notice here: *First*, the existence of true ensheathing callus in a flat bone; *second*, its presence where there could have been no motion of the opposing fragments, and consequently no *necessity* for a "provisional splint."

If by fracture of the "neck of the scapula" is meant a fracture which detaches the glenoid cavity from the body of the bone, it is certainly very rare, and, indeed, its existence is doubted by Sir Astley Cooper, South, Erichsen, and others. Mr. South says there is no such specimen in any of the museums in London. Dr. Mott has said to me, also, that he has never seen a specimen, and that in the normal state of the bone he regards its occurrence as utterly impossible. Such, I confess, is my own conviction. If, however, it is intended, in speaking of fractures of the "neck of the scapula," to refer only to fractures extending through the semilunar notch, behind the root of the coracoid process, and this ought to be regarded as the only appropriate use of the term, then its existence is certain, yet the fracture is not common. Duverney has reported one case, the condition of which he proved by an autopsy. The coracoid process was broken at the same time, but the fracture through the neck of the scapula was distinct from this.[1]

I am told, also, that Dr. Mott has in his possession a scapula

[1] Traité des Fractures, etc., par J. F. Malgaigne. Tom. i. p. 512.

which appears to have been broken through its neck, and behind the root of the coracoid process, and which has united with very little displacement.

Mr. Fergusson has given in his book a picture representing a fracture through both of the lines which we have described, but it is a mere "fancy sketch," and ought never to have been permitted to disfigure so excellent a treatise.

Examples of fracture of the acromion process have been reported by Duverney, Bichat, Avrard, A. Cooper, Desault, Sanson, Nélaton, Malgaigne, Brainard,[1] and others.

In the case mentioned by Cooper, it entered the articulation of the clavicle, and produced, at the same moment, a dislocation. Malgaigne says it occurs generally further up, and beyond the articulation, "*near the junction of the diaphysis with the epiphysis.*" "It generally breaks at right angles and vertically," but in Nélaton's case it was oblique.

There is some reason to believe, I think, that a true fracture of the acromion process is much more rare than surgeons have supposed, and that in a considerable number of the cases reported there was merely a separation of the epiphysis; the bony union having never been completed. If such fractures or separations occurred in children, very little doubt could exist as to the nature of the accident generally, but the specimens found in museums, and the cases reported in the books have been mostly from adults. It is more difficult, therefore, to suppose these to be examples of separations of epiphyses, but I am inclined to think that in a majority of instances such is the fact. It is very probable, also, that in the case of many of the specimens found in the museums, the history of which is unknown, they were united by only cartilage until, in the process of boiling or maceration, the epiphysis became separated; and being found in this condition, they have been mistaken for fractures.

This supposition may explain the almost constant absence of displacement, and of ensheathing callus (except a narrow crest mentioned by Malgaigne, the character of which must be doubtful. Indeed, it seems to me more like the crest upon which a fibro-ligamentous capsule or periosteum has been attached).

In order to a better understanding of certain peculiarities of this fracture I shall quote from Malgaigne, who speaks more at length

[1] Case of supposed fracture; and prosecution of the surgeon for alleged malpractice.—*Bost. Med. Journ.*, vol. xxxi. p. 501. Also, *Illinois Med. Journ.*, 1845.

upon this subject than any other writer known to me; but to whom the probability of a disjunction of an epiphysis being mistaken for a fracture, does not seem to have occurred.

"The prognosis given by authors is very contradictory. Heister and Boyer regard it as impossible to obtain an exact union, and without deformity; but while the first believes that the elevation of the arm will always remain constrained, the second teaches that a slight deformity does not in any degree compromit the movements and the strength of the member" (p. 509). "And, in fact, with Desault's patient, all constraint had disappeared at the 48th day. M. Sanson has even obtained a cure as complete in 30 days, in a case more difficult; the acromion having been divided by a sabre-cut" (p. 509).

"A. Cooper has noticed another danger; bony callus, according to him, is rare in these fractures, and there results generally a false joint (*pseudo-arthrose*). He reports a case of this kind. MM. Nélaton and Avrard have each seen another, and the bony callus is equally wanting in the pieces represented in vol. iv., Figs. 1, 2, and 4, and upon another piece in the Dupuytren Museum. Perhaps in these different cases we ought to accuse generally the bad complications, or the indocility of the patients; in fact, in the observation of Bichat, the consolidation was completed on the 32d day. One of the patients of M. Avrard having thrown off the bandages on the 10th day, recovered with a complete union. I have myself seen an example in which it was impossible by the touch to discover the place of the fracture. I think that we ought to establish a distinction between fractures without displacement and almost without rupture of the periosteum, and those which are not thus conditioned; yet even here the treatment employed, and the docility of the patient, no doubt, do much towards the result.

"When bony callus is not formed, A. Cooper says that the fragments unite by a fibrous tissue. I have verified this mode of union upon the pieces represented in Figs. 1 and 2; but upon that represented in Fig. 4, the fractured surfaces appear eburnated, as if they had rubbed one against the other, and I readily incline to believe that there had existed here a joint.

"However this may be, it has happened to me to notice on all the pieces that I have seen, that the superior borders of the fracture are surmounted with little bony crests, of a recent formation, and of which the largest part pertains to the scapular fragment (see especially Fig. 4), as if the work of ossification was more active on

this side, and the detached extremity of the acromion possessed a less degree of vitality. But another specimen in the Dupuytren Museum presents a strange phenomenon, which obliges us to modify this conclusion.

"The external fragment has a diameter almost double that of the other, so that while the upper surface is level, the lower surface projects considerably; and it has thus led the person who made the catalogue into the error of supposing that the fragments were overlapped. It is, however, a hypertrophy of the detached fragment, a phenomenon which has not, to my knowledge, been heretofore noticed, and which we shall again meet with in other fractures." (*Traité des Fractures et des Luxations*, tom. i. pp. 509–10.)

Of the nine specimens reported to me, only one specimen seems to have been beyond doubt a fracture. The first six are pretty certainly only separations of the epiphyses. Of the specimens 1 and 2, belonging to the Wistar and Horner Museum, Dr. Henry H. Smith remarks, that they were found in the dissecting-room, and in his opinion such specimens are not rare, and that they "are rather separations of the epiphyses than fractures, yet the surfaces of each portion are closed by compact bony tissue."

Dr. J. B. S. Jackson, of Boston, to whom I am indebted for much valuable information pertaining both to the Museum of the Mass. Med. Col. and to the museum of the "Soc. for Med. Improvement," alluding to the specimens Nos. 3, 4, 5, and 6, speaks as follows:—

"Of fractures of the acromion process we have, I believe, none; but we have four specimens that might be well mistaken for this accident, and in regard to which I have a few words to say.

"The acromion process ossifies in two pieces, which subsequently unite, and finally co-ossify with the bone itself. Now, three of the specimens referred to, show, I believe, a non-union of this process. The fourth specimen, which was the fifth in order that was met with, was found among some loose bones at the Med. College, and was at first thought to be a case of old fracture united by bone; from the circumstance, however, of the incomplete union of the epiphysis at the lower angle and along the base of the bone, I was subsequently led to think that the union of the acromial epiphysis as it may be called, might have recently occurred; the bony union was strong and complete, but the line of division between the epiphysis and the bone itself, was quite marked. Not long after this scapula was found, there was found a second at the College (No. 5), and I think not far from the first; and it was evidently its mate,

judging from the size, form, color, and degree of ossification. The acromion process, however, was in this specimen wanting. I presumed that it was not fully ossified, and, being ununited, was separated and lost when the bones were macerated. I should say that in the museum of our Medical College are several collections of bones, from as many different subjects apparently, and it would not therefore be unreasonable to regard these two scapulæ as mates. Last winter, Dr. Hodges, our demonstrator, found in a dissecting-room subject, and one that he thinks must have been at least forty years old, the acromial process of each scapula fully formed, but having no bony union whatever with the bone itself. The union was ligamentous, but strong and close, yet Dr. H. thinks that in one of the specimens there was almost a synovial cavity. I am not aware that this non-union of the acromial process in the adult subject has ever been described, though I should think that it must have been. It is obvious, however, that such a mistake as has been above referred to might very well be made."

Mr. Lizars has remarked that "in some individuals the acromial process continues an epiphysis during life," and Mr. Fergusson says "the acromion may be broken, but the accident is of rare occurrence." * * * "I have dissected a number of examples of apparent fracture of the end of this process; but in such instances it is doubtful if the movable portion had ever been fixed to the rest of the bone."

In addition to the specimens which I have already mentioned, of epiphyseal disjunctions, it has occurred to me to see the same in a number of instances, and in nearly every instance I have noticed the existence of a more or less compact tissue between the adjacent surfaces, and of a slight rising along the margins of the fragments.

I am surprised that Mr. Lizars should have never seen a case, nor heard of a well authenticated example of fracture of the coracoid process. "The coracoid process," he remarks, "is said to be broken off, but this I question very much; it must be along with the glenoid cavity, or there must be fracture of the neck of the scapula."[1]

Three of the specimens recorded by me are fractures of the coracoid process simply, and in only one case is the glenoid cavity at all implicated; nor even here is there a fracture of the "neck of the scapula," nor is the "glenoid cavity" borne along with the pro-

[1] System of Practical Surgery, by John Lizars. Edinburgh, 1847, p. 132.

cess. One example occurred in the practice of Mr. Arnott, at the Middlesex Hospital, London; in consequence of which the patient died, and an autopsy disclosed the true nature of the accident.[1] Mr. South has reported, also, in the *Lond. Med.-Chir. Rev.*, for 1840,[2] a case complicated with partial forward dislocation of the humerus, fracture of the clavicle, acromion process, and of the olecranon process. The patient died on the fourth day, and Mr. South has published the result of the autopsy. He confesses frankly, also, that neither the fracture of the clavicle, nor of the coracoid process was discovered before death. Erichsen says there is in the museum of the University College, a preparation showing a fracture of the base of this process, implicating and extending across (not *behind*) the glenoid cavity.[3] Duverney examined after death a patient who had a fracture of this process, and also a fracture of the neck of the scapula.[4] Boyer also examined one after death, and Malgaigne has seen two, of one of which he furnishes a drawing.[5]

In addition to these actual specimens, several cases have been reported by gentlemen of unquestioned authority. The accident is certainly not common, and in a majority of instances where it is known to have occurred, the concomitant injuries have been so great that the patients have died.

In specimens 1 and 2, belonging respectively to Drs. Neill and Gibson, the fragments are suspended by a ligament, and in specimen 4, belonging to the Mass. Med. Col. Museum, and reported to me by Dr. Jackson, the process, broken at its base, had evidently united by bone.

Of the treatment of fractures of the coracoid, or of the acromion process, I have only one general observation to make. It is very obvious that in neither of these fractures can anything be accomplished by splints, and probably quite as little by position. All that the surgeon can do is to enjoin rest, and, if necessary, to enforce it by suitable bandages, and to control inflammation.

If the neck of the scapula is broken, whether the fracture be simple or comminuted, the rational indication seems to be to place a moderate compress in the axilla, and having disposed the arm in a sling, to secure the elbow snugly against the side of the body.

[1] Fergusson's Surg., p. 213.
[2] Vol. xxxii. New Series, pp. 41 and 2.
[3] Science and Art of Surgery, by John Erichsen, p. 207.
[4] Traité des Fractures, etc., p. 512.
[5] Ibid., 512.

CHAPTER VII.

HUMERUS.

Upper Third.

Separation of Epiphysis.

CASE 1. *Separation of upper epiphysis. Non-union.*

Mike Bovin, son of Peter B., cor. Washington and Tupper Sts., Buffalo, æt. 13 months, fell sideways from a cradle, about the 20th of Nov. 1855, striking upon his left shoulder.

He was taken to a German empiric, who called it a sprain, and applied liniments. Three weeks after the accident he was brought to me, and I found the arm hanging beside the body, with little or no power, on the part of the little patient, to move it. There was a slight depression under the acromion process, and considerable tenderness about the joint. The shoulder was not swollen, nor had it been at any time.

On moving the elbow backwards and forwards, the upper end of the lower fragment moved in the opposite directions with great freedom, and accompanied with a slight sound, a sound not like the grating of broken fragments, but less rough. The freedom of motion was such between the fragments, that it would almost lead one to suppose that it was the head of the bone playing backwards and forwards in an elongated capsule. There was no overlapping or tendency to displacement. Bringing the elbow a little forward, secured apparently, complete coaptation of the fragments, and of this I judged by the restoration of the line of the bone towards the socket, and by the disappearance of the depression under the process, for the head of the bone could not at any time be felt.

Five months after the injury was received, the fragments had not united, and the child was still unable to lift the arm, although the forearm and hand retained their usual strength and freedom of motions. The same crepitus could occasionally be detected in the shoulder-joint, and the same preternatural mobility. The shoulder was neither swollen nor tender.

Surgical Neck.

CASE 2. *Simple fracture; never displaced. Union without deformity, and treated without apparatus.*

Brisbane, of Batavia, æt. 65. Mr. B. fell through the trap-door of the Eagle Street Theatre, striking upon the axilla of the right arm.

Dr. Sprague, of Buffalo, was called, and after examination pronounced it a fracture of the surgical neck of the humerus. At Dr. Sprague's request, I examined it, also, within an hour after the accident. Crepitus was easily discovered, which, with motion at the seat of fracture, seemed to render the diagnosis certain. There was, however, no perceptible displacement. We concurred entirely as to the nature of the accident, and dressed the arm with splints, rollers, &c. We subsequently learned that all dressings were removed at the end of the first week, and that they were not reapplied, his family physician believing that the bone was not broken. No deformity ensued.

The examination made by Dr. S. and myself at the time of the accident, was careful and satisfactory, and we have seen nothing in the result to change our convictions.

CASE 3. *Simple fracture; never displaced. Union without deformity.*

Alexander Balentine, æt. 62; admitted to the hospital, Dec. 19, 1851. He had fallen upon the sidewalk, striking upon his right arm. Dr. Johnson, of Buffalo, had reduced the fracture, and applied appropriate dressings. No union of the fragments had yet occurred, but as the surfaces were in apposition, it was only after considerable manipulation, and not until we bent the forearm upon the arm, and rotated the humerus by means of the forearm, that the crepitus became distinct, and gave unequivocal evidence of the existence of a fracture, and of its situation.

The treatment, after admission, consisted in the application of one gutta-percha splint, accurately moulded, and extending from above the shoulder to below the elbow, and encircling one-half of the circumference of the arm. The splint being secured with the usual bandages, &c.

The result is a perfect limb.

CASE 4. *Simple fracture. Union with displacement and deformity.* White, of Buffalo, æt. 12, fell 14 feet, striking on the front and outside of the left shoulder. Dr. P., of Erie Co., saw the lad within three hours (July 19th, 1853). He was brought to me on the 4th day after the accident. The upper part of the arm was then very much swollen. I found the arm dressed as for a fracture of the middle or lower third of the humerus. It was shortened one inch. The elbow was inclined backwards, and there was a remarkable projection in front of the joint, feeling like the head of the bone. The hand and arm were powerless. I suspected a dislocation of the head of the humerus forwards; and having administered chloroform, I attempted its reduction with my heel in the axilla. While making extension I felt a sudden sensation, like the slipping of the bone into its socket, but on examination I found the projection continued as before. I then repeated the effort, and with precisely the same result.

I now applied an arm sling, and directed leeches and cold evaporating lotions.

On the 25th, five days after the accident, it was examined by Drs. Mixer, McGregor, Joseph Smith, with myself. We still believed it was a dislocation, and having administered chloroform, we again attempted its reduction. The same *slipping* sensation was produced as before, and the deformity was repeatedly made to disappear; but on suspending the extension, it as often reappeared.

The character of the accident was now made apparent, and we proceeded at once to apply the splint and bandages suitable for a fracture of the surgical neck of the humerus, namely, a gutta-percha splint, extending on the outside, from the top of the shoulder to below the elbow, with an arm and body roller, secured with flour paste.

On the 31st, twelve days after the accident, Dr. Wilcox, marine surgeon at Buffalo, saw the arm with me. The fragments were displaced, the same as when I first saw it, and the same as when no apparatus was applied. We examined it again carefully and attempted to make the fragments remain in place, but we were unable to do so, except while holding them, and making extension.

August 9th (21st day), Dr. Bowen, Prof. of Anat. in Geneva Medical College, being present, I removed all the dressings. Motion between the fragments had ceased, but the projection and shortening remained as before; now, also, the irregular projections of the fractured bones were more distinctly felt.

The dressings were never reapplied. Three months later no change had occurred. He could carry the elbow forwards freely, as well as backwards, the motions of the shoulder-joint being unimpaired.

CASE 5. *Simple fracture, with displacement; resulting in deformity and non-union.*

L. Brown, of Lockport, æt. 43, was thrown from his horse in Feb. 1854, striking upon his right elbow.

Dr. Maxwell, an experienced surgeon of Lockport, examined and dressed the fracture. Dr. Fasset was present, and assisted at a subsequent dressing. Three surgeons who examined the arm before Dr. M., called it a dislocation.

Twelve weeks after the accident, Mr. B. called upon me. The right arm was shortened one inch; the elbow hung slightly from the body; the upper end of the lower fragment was distinctly felt in front of the shoulder-joint under the clavicle, feeling very much like the head of the bone. The fragments were not united, but they could be seized easily, and made to move separately and freely. He stated to me that he was subject to rheumatism, and especially in the shoulder and arm of the side injured. He wished to know whether it could not be "re-set."

Two years after, I was informed by Dr. Maxwell that the bone was still ununited. He was, however, able to write with that hand, having first lifted this arm with the other hand, and laid it upon the table. He says the upper end of the lower fragment is in the axilla.

CASE 6. *Simple fracture; probably impacted; resulting in deformity.*

Wm. Adams, of Buffalo, æt. 15, fell backwards, June 4, 1855, striking on his back and left shoulder. Dr. L. saw it immediately, and regarding it as a dislocation, attempted its reduction. He subsequently repeated the attempt. I saw the patient, with Dr. L., on the 10th day. The arm was shortened one inch and a half. The fragments were displaced forwards, and prominent in front of, and a little below the joint. As in Case No. 4, it might easily be mistaken for the head of the bone; but the difficulty of diagnosis had been very much lessened by the subsidence of the swelling. There was no motion between the fragments; nor could the deformity by any manipulation, or extension, be made to disappear. It was probably impacted.

March 23, 1856, nearly ten months after the accident, I found the

fragments remaining as when I first examined it, and the arm shortened one and a half inches. The elbow hung a very little back from the line of the body. The upper end of the lower fragment was lifted to within one inch of the head of the humerus; the upper fragment having its head in the socket, with its lower end directed forwards and downwards. The arm was, however, in every respect as useful as before it was broken. It was equally strong, and he could raise his arm as high, and move it in every direction as freely as he could the other.

CASE 7. *Supposed dislocation of the right humerus forwards, with a fracture of the same bone at its surgical neck; also a dislocation of the thumb and middle finger of the same arm, with a dislocation of the opposite shoulder. Union of the fracture without deformity.* (See *Transactions of the N. Y. State Med. Society*, 1856, p. 44.)

Michael Crichton, of Buffalo, æt. 30. A laborer. These injuries, with several lesser injuries, were received in consequence of being caught in the machinery of an elevator. All of them, except the dislocation of the right arm, were treated by Dr. Sprague, before admission to the hospital. The patient having already suffered considerably, in the reduction of the dislocations and in the dressing of wounds, and being much exhausted, the treatment of the shoulder and arm was referred to me, by a note from Dr. Sprague, with a suggestion to defer this until after the patient should have become rested. I saw Crichton in his ward on the next day after the accident, and found a fracture of the left humerus through its surgical neck. Of this no doubt existed, for the ends could be made to crepitate, and also to bend freely upon each other. I discovered, also, the head of the bone in the axilla, and supposed it was dislocated in that direction. The swelling was considerable, and only temporary dressings were applied. On the 28th, seven days after the accident, I consulted with Dr. White, and we concurred in the above diagnosis. On the 29th I consulted with Dr. Sprague, and we also being agreed in opinion, I proceeded with Jarvis's adjuster to attempt a reduction of the dislocation. The patient was advised that we should probably not succeed. The extension was continued nearly 30 minutes, and no change in the position of the bone was effected. It must be remembered that the fracture of the humerus was at a point so near the joint that it was impossible to seize upon the upper fragment, and we only hoped to succeed in the reduction through the aid of such soft attachments as might continue to exist

between the upper and lower fragments, and by pushing on the head of the bone as it lay in the axilla. Renouncing at length all expectation of ever reducing the dislocation, we adjusted the fracture of the humerus, and applied the usual lateral splints and roller, placing a moderate pad in the axilla, and then securing the arm tightly to the body.

The patient was too ill to leave his bed, and was laid on his back, with his left forearm across his chest. The same dressings were continued, with only occasional removals for the purpose of examining the fracture, until the 1st of January, 1850, nearly six weeks, when the bandage and splints were finally laid off. The fracture was then united. I now discovered, also, that the head of the humerus was exactly in place, and so it has remained ever since.

The motions of this shoulder are as extensive and free as before the injury, and much more so than the motions of the right shoulder. There is no depression under the acromion, or fulness in the axilla. In short the shoulder is perfect. Possibly what we supposed a dislocation, was a fracture of the neck of the scapula, allowing the head of the humerus with a portion of the scapula to fall into the axilla; and, if so, we must assume that by means of the axillary pad, and the band securing the arm to the body, the reduction was effected without our knowledge or intention. If this explanation is not adopted, we must believe either that the head of the dislocated bone resumed its place in consequence of our manipulations, and without our knowledge, or through the subsequent pressure of the axillary pad; or that Drs. Sprague, White, and myself, with others, were altogether in error in supposing that the head of the bone was ever in the axilla. Which of these several suppositions is the most probable, I shall not attempt to determine.

CASE 8. *Simple fracture, complicated with fracture of the forearm in its lower third. Result perfect.* (See Fracture of the Forearm, Case 31.)

Matthew Rigany, æt. 23. Admitted to the hospital May 7, 1849. The accident had occurred on the 3d, by having had his arm caught in the crank of a hand-car, when the car was under full motion.

A broad gutta-percha splint was applied to the palmar surface of the forearm and hand, and a broad splint to the dorsal surface of the forearm, and smaller splints were laid around the humerus; the whole being secured by a roller.

On the 6th of June, a starch bandage was substituted, the swelling having sufficiently subsided. On the 16th this was removed,

and the patient dismissed, cured. There was no shortening of either the arm or forearm; but the arm was very slightly bent at the seat of the fracture.

Below Surgical Neck (Upper Third).

CASE 9. *Fragilitas ossium. Simple fracture, occurring at several dates. Union without displacement.*

The following account of this interesting case was furnished by Dr. Mixer, of Buffalo, who was the attending surgeon. I was permitted, however, myself to see the patient at different times, and to examine the arm.

"I was first called on the 21st of January, 1851, to see John Thomas, a native of Wales, Eng., æt. 54; a tailor by trade; light complexion and light hair; who had an hour before broken his right humerus at about the union of the upper and middle thirds. It had occurred while raising about 14 lbs. of clothing to a shelf as high as his head, and seemed at the time as though he had received a severe blow on his arm.

"I found the fracture quite transverse, a 'pipe-stem' fracture. There was but little swelling or pain. After a few days I applied the starch bandage or roller, and union took place as promptly as in ordinary fractures, notwithstanding the seeming want of vitality in the bone. As a matter of precaution, I advised him to keep a part of the splint bandaged to the arm for one or two months. Again I was called to see Mr. T. June 11, 1852, and found he had fractured his left arm at about one-third the distance from the elbow, while taking down the shutters to his store. This was also transverse, or nearly so. I again applied the paste splints, and in due time he was well. In this, as in the first fracture, very little inflammation supervened.

"Again, on the 15th of November, 1853, Mr. Thomas called at my office to say that his arm had troubled him for two or three months, and that he was obliged to raise it with the other hand on the cutting table, yet that he found but little difficulty in cutting clothes all day, although it was not as strong as the other arm. On examining it I found the bone broken near the centre of the right arm, and so very flexible that I could bend it at an angle of from ten to twenty degrees. Here I expected great difficulty in effecting a union of the bones, as they had been in that condition two or three months; and I so expressed myself to him. I immediately

applied the same dressing as before, and union was effected in nearly the same length of time as before. I then had prepared a permanent paste splint, and recommended him to wear it constantly.

"Soon after that, Mr. T. went into the country to reside, and I did not see him again until November 30, 1854, when he called to have me apply the splint to his left arm, as it had troubled him of late.

"On examination, I did not detect any fracture; still the bone seemed quite sensitive, and he had the same rheumatic pains which had preceded all the other fractures, for two or three weeks. I applied the dressings, and have not seen him since, but have recently learned from his daughter, who resides in the city, that her father died of dysentery in October last." (1855.)

CASE 10. *Simple; slightly oblique fracture. Union perfect.*

B. Franklin McCall, of Buffalo, æt. 11. I dressed the fracture with four lateral splints. At the end of eight weeks it was perfectly united, and without deformity.

CASE 11. *Simple oblique fracture. Union without shortening or deformity.*

James Cronin, of Buffalo, æt. 30, very intemperate. He had his left arm broken September 29, 1853, by a log which rolled upon him. The fracture was simple and oblique, and situated just in or above the insertion of the deltoid. It was dressed by Dr. Nott, of Buffalo, and on the third day Dr. Nott sent him to the hospital.

On the night after his admission, in a fit of delirium tremens, he removed all the dressings, and on the following morning his arm was much swollen. The fragments were displaced, and the muscles were contracting violently. Having reduced the fragments as well as possible, I applied two broad and long splints of binder's board, securing them with rollers covered with flour paste. Notwithstanding the use of opium in full doses, he continued delirious, and on the fifth day of the fracture (October 4th), I found everything loose about the arm. I therefore again removed all the dressings. We now determined to make an attempt to accomplish permanent extension and counter-extension. For this purpose we lifted the elbow upwards and outwards to relax the deltoid, and then having made extension, we fitted carefully a large gutta-percha splint to the forearm and axilla, in such a manner as that when the splint was secured to these several parts the arm could not fall to the side

of the body, and in proportion as it did fall downwards it would make extension upon the arm. This splint was well padded and secured with rollers. A pillow was also tied under the arm.

Oct. 5. The dressings remain in place and seem to accomplish everything we could desire.

9th. He is still delirious at intervals. Dressings all loose, and have been for three days, requiring constant readjustment. We removed them and applied three lateral splints with a cushion in the axilla, and bandaged the whole snugly to the body. Forearm in a sling.

19th. (20th day since fracture.) Removed dressings. Fragments not united. Applied paste bandage, &c.

Nov. 6. (38 days.) Removed dressings. Fragments united. No ensheathing callus; no overlapping; no deformity. This result is to me very unexpected and almost inexplicable.

CASE 12. *Simple fracture and union delayed five months. Result nearly perfect.*

Henry Angles, of Tonawanda, æt. 38, broke left humerus obliquely, in upper third, by a fall from a hay rack, striking upon his elbow.

Dr. F. Hoyer, of Tonawanda, dressed the arm on the same day, with two lateral board splints well padded and sufficiently long. Forearm placed in a sling. Dr. H. saw and examined the arm once or twice a week during the time of treatment. The dressings were first removed about the ninth day. The treatment was continued five or six weeks. Finding at this time that there was no union, Dr. H. removed the dressings entirely, and directed him to use his arm freely. After about one week the splints were again applied in the same manner. Soon after, Dr. H. again removed the dressings, and they were not reapplied until about the 7th of October, 1851.

I saw Angles October 4, 1851, about four months after the accident. The fragments had not then united, and were overlapped about half an inch.

Within three weeks probably from this time union was tolerably firm. Nearly five months elapsed from the time of fracture to the date of its complete consolidation. The shortening remained as when I saw it. He gradually regained the perfect use of his limb.

The habits of this man were rather intemperate, and he had intermittent fever only a short time before the accident occurred.

To these causes mainly the delay in union ought to be ascribed. Mr. Angles died about one year since.

CASE 13. *Simple fracture complicated with abscess and tetanus. Resulting in death.*

Samuel J. Mills, of Buffalo, æt. 35; very muscular; was crushed under an enormous mass of iron, breaking his right arm just above the insertion of the deltoid. Dr. Mixer and myself in attendance. We could not at first discover crepitus. The muscles contracted with great force when the arm was moved, and swelling came on rapidly.

We made as much extension as the patient would bear, and then applied three well padded lateral splints and secured them with a roller. The hand and the forearm were also covered with rollers.

The left thigh was at the same time severely lacerated, and soon became very painful, especially along the course of the anterior crural nerve.

On the seventh day I dressed the arm with gutta-percha splints, and paste rollers. On about the twelfth day, an irritative fever supervened with tetanic symptoms, and on the twenty-second day he died. In the meanwhile abscesses had formed around the seat of the fracture and in the thigh; from the latter of which pus was copiously discharged for many days before his death.

The autopsy showed both of the abscesses to be large; and in relation to the femoral abscess, and the condition of the parts adjacent. Dr. Hunt, who conducted the autopsy, says: "Its entire length was about six inches. The internal saphenous vein was nearly obliterated by a deposit of lymph. The sheath of the femoral vessels was not ruptured; but upon laying it open the femoral vein was seen somewhat thickened, the artery round and elastic. Opposite the points of injury, the inner and middle coats of the artery were ruptured, leaving a ragged and lacerated opening. Below this the artery was imperforate. There was no clot, or other appearance of aneurism. The condition of the anterior crural and internal saphenous nerves was not noticed, though they were involved in the injury."

And of the condition of the arm he adds: "The fracture was at the upper part of the insertion of the deltoid muscle. It was an oblique fracture, and a portion of the insertion of the deltoid was attached to the upper fragment; but the greater part, to the lower fragment of the bone. The muscle itself was torn asunder in the

direction of its fibres, by the separation of the fragments. The upper portion rested its broken extremity against the skin of the anterior surface of the arm.

"The lower fragment was carried upwards and outwards by its portion of the deltoid; it was sharp and pointed, and the muscle closely embraced it. I then detached the deltoid from its insertions, and reflected it. Its inner surface was smooth, without any mark of abrasion from the sharpened end of the bone. The cavity of the abscess was now exposed. This cavity, filled with pus, separated the deltoid from its relations with the shoulder-joint; leaving the circumflex artery and nerve projected across the cavity of the abscess, unsupported by surrounding tissues. From the neck of the humerus downward, the cavity involved the ends of each fragment of the bone; at the point of fracture, denuding the periosteum. Thence it extended downward nearly to the elbow-joint, burrowing along between the brachialis anticus and the biceps muscles."

Middle Third.

CASE 14. *Fragilitas ossium. Simple fracture (occurring at several dates). Result perfect.*

John Thomas, æt. 56. (See Case 9.)

CASE 15. *Simple fracture. Union without deformity.*

E. F., æt. 18, broke his left humerus in its middle third. Simple fracture. Dr. Stinberg, of Palentine, N. Y., dressed the arm. Twenty-five years afterwards, when I examined the arm, there was no evidence that a fracture had ever existed.

CASE 16. *Simple fracture, occurring during labor. Union without deformity.*

Catharine McKinney, of Buffalo, was born June 3, 1855. The mother was in labor six or eight hours. Labor not severe. She does not know whether the midwife used violence or not.

The child was wrapped up and not examined or washed until the third day, when the mother discovered that the left arm was broken completely, so that it moved as freely as the elbow-joint. Dr. J. T. Lockwood, of Buffalo, was called, and applied lateral splints and bandages. On the seventeenth day after the birth of the child, Dr. Lockwood requested me to see it with him.

The seat of fracture, the lower end of the middle third, was then surrounded with a perfect ferule of ensheathing callus, which, owing to the softness of the flesh, could be very easily felt and defined. The fragments were united and in place. Dr. Lockwood said he found them firm on the 14th day. We reapplied a splint made of gutta percha.

April 1, 1856. I examined the arm. The seat of fracture could not be felt, there being no overlapping or remains of ensheathing callus. The arm is in every respect like the other.

CASE 17. *Fracture resulting from secondary lues. Perfect union.*

A. A., aged 45, had chancres two years since (1849). Has had no bubos or secondary symptoms until now. His gums are now spongy. Six months ago a pain commenced in the right humerus, and one month later, from a slight accident, the arm broke at the seat of pain. In four months it was united and perfect.

About four months since, the left humerus began to pain him in a similar manner, and he is apprehensive that it will break also.

CASE 18. *Simple fracture. Union with shortening.*

J. M. C., æt. 63, broke his right arm near its middle. It was dressed by a surgeon, in Mexico. Two years after the accident I saw him, in Auburn State Prison. The arm was shortened about one inch, and it was not as strong as before.

CASE 19. *Simple fracture. Shortened.*

Charles Clark, of Otisco, Onondaga Co., N. Y., æt. 33, broke his left humerus near the middle. Dr. Luther French, of Otisco, dressed the fracture with splints, &c. The arm, after thirty years, is shortened half an inch, and a moderate displacement can be felt at the seat of the fracture.

CASE 20. *Simple fracture. Union with shortening.*

Sutter, of Buffalo, æt. 13, broke his arm through nearly the middle of the humerus. Dr. John A. Jeyte, of Buffalo, was called and treated the fracture.

Five weeks after the accident, I measured the arm, and found it shortened half an inch.

CASE 21. *Simple fracture. Non-union of the fragments.*

James Campbell, of Canada West, æt. 35, an employé on the

Buffalo and Brantford Railroad. His right arm was broken a little below its middle. Fracture simple. It was dressed by Dr. Jerron, a very intelligent Canadian surgeon, at Brantford, C. W.

Five months after the fracture he called upon me. I found the elbow fixed at right angles, with muscular anchylosis, and no union at the seat of fracture.

He promised to return and place himself under my care, at the hospital, but he did not, and I have not learned the final result.

CASE 22. *Simple oblique fracture. Delayed union. Fracture made to unite after straightening the arm, &c.*

Michael Mahar, laborer, æt. 35, broke his left humerus just below its middle, Dec. 14, 1853. The arm was dressed by a surgeon in Canada West, and who is well known to me as exceedingly "clever." After a few days from the time of the accident, "the starch bandage was put on as tight as it could be borne, and brought down on the forearm so as to confine the motions of the elbow-joint."

Six weeks after the injury, Jan. 29, 1854, Mahar applied to me at the hospital. No union had occurred. The motion between the fragments was very free, so that they passed each other with an audible click. There was little or no swelling or soreness. In short, everything indicated that union was not likely to occur without operative interference. The elbow was completely anchylosed. His health was unimpaired.

I explained to my students what seemed to me to be the cause of the delayed union, and declared to them that I did not intend to attempt to re-establish adhesive action until I had straightened the arm. They had just witnessed the failure of a precisely similar case, in which I had made the attempt without straightening the arm, and without success.

Feb. 6, 1854. I had succeeded in making the arm nearly straight. I now punctured the upper end of the lower fragment with a small steel instrument, and as well as I was able, thrust it between the fragments. Assisted by Dr. Boardman, I then applied a gutta percha splint from the top of the shoulder to the fingers, moulding it carefully to the whole of the back and sides of the limb, and securing it firmly with a paste roller.

March 4. (Not quite four weeks after the application of the splint) I opened the dressings for the second time, and carefully renewed them. A slight motion was yet perceptible between the fragments.

18*th*. I opened the dressings for the third time, and found the union complete. This was within less than forty days.

The patient was now dismissed. On the 29th of April following, the bone was refractured. Mahar had been assisting to load the "tender" to a locomotive. While the train was just getting in motion, he was hanging to the tender by his sound arm, when another laborer seized upon his broken arm to keep himself upon the car, and with a violent and sudden pull wrenched him from the tender, and reproduced the fracture.

The next morning I applied the dressings as before, and did not remove it during three weeks; at the end of this time the union was again complete. The splint was, however, reapplied, and has been continued to this time—a period of about six weeks.

CASE 23. *Comminuted fracture. Union without shortening.*

Peter McCarty, of Buffalo. (See Fracture of Lower Third, Case 32.)

Above Base of Condyle (Lower Third).

CASE 24. *Fragilitas ossium and simple fracture (occurring at several dates). Union without displacement.*

John Thomas, æt. 56. (See Case 9.)

CASE 25. *Simple fracture. Union perfect.*

Emma Hollidge, of Buffalo, æt. 3, broke her right arm in Feb., 1852, two inches above the elbow. The fracture was dressed by Dr. Sprague, of Buffalo. Three months afterwards, Mr. Hollidge brought her to me to know whether the slight stiffness of the elbow which was remaining, did not indicate that it had been badly set.

I discovered no other imperfection than the stiffness, and this I assured him would soon disappear.

CASE 26. *Simple fracture. Perfect union.*

W. C., æt. 4, broke his humerus through its lower third. It was dressed by a surgeon in Burlington, Vt. Twenty years after, I saw and examined the arm in the Auburn State Prison. The union was so perfect that the point of the fracture could not be discovered.

CASE 27. *Simple fracture. Union nearly perfect.*

H. Copp, æt. 18, had his arm broken, February 10th, 1854, by

the fall of a tree upon it. Dressed within an hour, by Dr. H., of Buffalo.

Admitted to the hospital, Feb. 12, and dressed by myself with starch and pasteboard splints, on the 15th.

March 10. Fragments united with very slight overlapping; perhaps one-quarter of an inch. Dressings continued. Dismissed.

CASE 28. *Simple fracture. Result nearly perfect.*

Silas McNeal, of Orleans Co., æt. 32, broke his humerus through its lower third. Dr. Beecher, of Gaines, Orleans Co., dressed the arm.

Fifteen years after the accident, I found the elbow a little stiff, so that he could not straighten it perfectly. In other respects the arm was as before the fracture.

CASE 29. *Simple oblique fracture. Result nearly perfect.*

James Gallon, æt. 40, of Albion, N. Y., fell from a wagon and struck upon his elbow, breaking the humerus obliquely, two and a half inches above the condyles.

Dr. D. M. Hotaling, a very intelligent surgeon of Waterport, Orleans County, was called. Dr. H. applied three splints, carefully padded, which were renewed on the ninth day. The same splints were reapplied and continued in all forty days.

At this time the elbow was stiff. The humerus united, but it was shortened half an inch, and slightly bent forwards at the seat of the fracture. His purpose in calling upon me was to know whether the elbow was not "spoiled," and whether he ought not to claim damages from the Dr.

I could see no error in the treatment, and nothing unusual in the result, and so I informed him. The arm remained powerless about three months, and then gradually regained its wonted strength under the use of the cold douche. Four years after, he was working as a tanner and currier, flexion and extension were nearly restored, and his arm was about as strong as before.

CASE 30. *Simple fracture. Shortened; arm considerably weakened and wasted.*

A. G. Ellwood, æt. 7, of Clinton, Oneida Co., N. Y. While wrestling, he fell with the weight of his body upon his left arm, breaking it at the upper end of the lower third. Dr. Gridley, of Clinton,

dressed the fracture, about three hours after, with splints and rollers.

Fifteen years after the accident, the arm is shortened half an inch, slightly bent inwards at the seat of fracture. The arm is not as strong as the other, and it is considerably smaller.

CASE 31. *Simple fracture. Union with shortening.*

James Evans, sailor, æt. 30, had his arm broken, Nov. 14, 1855, by the crank of a windlass, striking with great force against the front of his arm. The fracture was oblique, at the upper end of the lower third of the humerus.

I found the humerus shortened one and a half inches.

I reduced the fracture and applied a roller from the hand to the shoulder, and to the arm I applied three lateral splints made of binder's board. These I secured with several turns of a roller. The arm was then placed in a sling, a compress laid in the axilla, and the whole arm gently bound to the body.

Dec. 5. The bandages are tightened by a needle and thread.

14*th*. Dr. Samo, marine surgeon, removed the splints, but continued the roller. The fragments were united, but overlapped one and a quarter inches. The superior fragment is in front of the inferior.

CASE 32. *Comminuted fracture. Union without displacement.*

Peter McCarty, of Buffalo, aged about 30, fell, Oct. 8, 1855, into a ditch in the night, breaking his right arm at two points, one fracture being three inches above the elbow-joint, and one nine inches above. (See Fracture of Middle Third, Case 23)

I saw and dressed the fractures thirty-eight hours after the accident. Limb not much swollen. I applied a carefully padded, broad, and nicely moulded gutta-percha splint, which extended from the top of the shoulder to below the elbow, the forearm being placed in a sling at right angles with the arm.

The fragments united in the usual time, and without shortening or deformity.

CASE 33. *Compound fracture. Non-union.*

John Reynolds, of Hornelsville, æt. 30, broke his left arm, Aug. 2, 1853, in jumping from the cars when they were moving at full speed. The fracture was at the upper end of the lower third, oblique and compound. There were two wounds near the lower end

of the humerus, through both of which a fragment protruded. Dr. Ward, of Hornelsville, first dressed the fracture with an angular splint.

On the 5th of August, Dr. Van Curen, of Bath, took charge of the patient. Dr. V. found the arm very much swollen, and vesicated at several points.

Dr. Van Curen applied also an angular splint, placing the forearm at right angles with the arm.

This mode of dressing was continued six weeks, the wounds discharging all the time and being regularly dressed. No union having now taken place, Dr. Van Curen removed the angular splint, and applied three lateral splints to the arm. These were continued five or six weeks longer. The ends of the fragments were then rubbed violently together, and angular splints, made of binder's board, again snugly applied.

Dec. 27. Reynolds came to the hospital, and, on the 31st, five months after the accident, I examined the arm, and found the fragments moving very freely upon each other and slightly overlapped. I made an incision to the bone at the outer margin of the biceps muscle, and, having thrust a small trocar, covered with its canula, between the ends of the fragments, I withdrew the trocar and left the canula in the wound; this I secured with a bandage. The house surgeon then applied a right-angled gutta-percha splint, carefully moulded and padded.

On the fifth day, the inflammation, swelling, and suppuration were such that I was obliged to remove the canula. On the fourteenth day, inflammation not having abated, we applied emollient poultices; and, on the fifteenth day, I opened an abscess in the arm.

Jan. 18. The poultices were discontinued, and the patient was put upon generous diet and mineral tonics.

22*d.* I again punctured with a trocar the ends of the bones, and then applied splints, secured with bandages saturated with flour and the whites of eggs.

On the 31st, the wounds were still discharging copiously.

Feb. 12. Reynolds left the hospital. The bones were still ununited.

CASE 34. *Compound, comminuted fracture, complicated with dislocation at the shoulder-joint. Union with deformity. Shortening and anchylosis. Dislocation unreduced.*

John Phaley, æt. 25, broke his right arm, Sept. 15, 1852, at the

upper end of the lower third, and also the left leg, in a railroad accident. The fracture in the arm was comminuted. The right shoulder was also dislocated at the same time. He was seen first by Dr. Rogers, of Dunkirk; subsequently, on the second or third day, by Dr. Pratt, of Buffalo. Twelve days after the fracture, I found him an inmate of the hospital. The arm was then much swollen, and powerless; the upper end of the lower fragment projecting in front, and a sinus leading to the broken surfaces. At the end of six weeks, he left the hospital. The fragments were then united, but the lower fragment lay in front of the upper. There was also a sinus at the seat of fracture, communicating with the fragment of dead bone. Forearm powerless and much swollen, and elbow anchylosed. Some months later, I removed a considerable fragment of bone, and the sinus closed. On the 8th of March, 1853, about six months from the date of the accident, I discovered that the head of the right humerus was dislocated—a circumstance to which my attention had never been called before, and which neither Dr. Rogers nor Dr. Pratt had noticed. Two years after the accident, the head of the humerus could be felt and seen distinctly under the clavicle, having formed for itself a new socket. The deltoid was atrophied, and a marked depression existed under the acromion. Very little motion existed in the elbow-joint, which was bent at an obtuse angle. Motion in the new shoulder-joint was tolerably free, but accompanied with a grating sensation. His elbow hung outwards from his body, but not backwards. The arm was shortened one inch. He could use his arm and hand to cut his food, but he carried his food to his mouth with his left hand.

Base of the Condyles.

CASE 35. *Simple oblique fracture. Union without deformity or shortening.*

Wm. Kane, of Buffalo, æt. 6, by a fall July 28, 1853, broke his right humerus obliquely, just above the condyles. Direction of fracture downwards and forwards.

I saw the child soon after the fracture. The fragments were easily reduced, but immediately became displaced when left to themselves. I dressed it carefully with a paste bandage supported by an angular splint. (Rose's splint.)

Dr. Boardman, one of the surgeons of the Buffalo Hospital, subsequently took charge of him, and on the following day, finding

that the dressing was inefficient, we applied paste bandages and felt splints.

A good deal of inflammation and swelling followed the injury.

Aug. 8. (Eleventh day.) Dr. B. permitted me to see it. The fragments seemed to be united. Arm still remained a good deal swollen.

Three months after this I examined the arm before the medical students of the college. The union was firm, and the seat of the fracture could not be felt. Motions of the elbow-joint nearly perfect.

March 20, 1856. He cannot bring this forearm to quite so acute an angle as the other, and when he straightens the forearm it falls a little further back. In all other respects it is perfect. The seat of fracture cannot be felt, and there is no shortening.

CASE 36. *Simple fracture. Result imperfect.*

Nicholas Lang, of Millgrove, N. Y., æt. 4, fell down stairs September 9, 1855, and broke the right humerus just above the condyles. Direction of fracture, obliquely downwards and forwards. The fracture was dressed by Dr. Ernst Pupikofer, of Erie Co., N. Y., and on the eleventh day he was brought to me. The bones were not then united.

Union occurred in about four weeks, and the splints were entirely removed in about five weeks.

Three months after the accident, the power of extension was nearly complete, but flexion was restricted to an angle of about 60°. Rotation of forearm perfect. The utility of the limb is in no way impaired.

CASE 37. *Simple fracture.*

Louis Kock, of Buffalo, æt. 6, fell September 1, 1853, and broke the right humerus just above the condyles. Simple fracture. Dr. Mixer, of Buffalo, in attendance.

I saw the patient with Dr. Mixer on the second day. The lower fragment was displaced backwards. I have only been able to learn that the fracture united in the usual time.

CASE 38. *Simple fracture; shortened, deformed and maimed.*

Frederick Niento, of Buffalo, æt. 60, fell on his right elbow March 5, 1851, and broke the humerus just above the condyle. Dr. Hauenstein, of Buffalo, dressed the fracture. Seven months

afterwards he called upon me. It was then shortened half an inch, and considerably deformed at the seat of fracture. The upper fragment is behind the lower. There remains only a limited motion at the elbow-joint.

CASE 39. *Simple fracture. Union with deformity.*

July 28, 1849. An Irish boy, about nine years old, was sent to me by Dr. Samo, with a fracture just above the condyles which had occurred two months before, in Ireland. It was dressed by an Irish surgeon, and attended by him about two weeks.

The lower fragment was displaced backwards and united firmly. Motions of the joint were tolerably free.

CASE 40. *Simple oblique fracture. Union with deformity. Paralysis and contraction of finger. Prosecution.*

Charles Farnham (son of Orlando Farnham, a very respectable citizen of Chautauque Co., N. Y.) æt. 8, fell from a height of four feet, striking upon the floor, and breaking his left humerus just above the condyles. The direction of the fracture was obliquely downwards and forwards. Dr. A. H., of Pomfret, was called, but refused to visit the patient, declaring that he did not practice surgery. Two other physicians were then successively called, but they also declined positively, and Dr. H. being again earnestly pressed to go, consented, though very reluctantly.

Dr. H. determined easily the nature of the fracture, but as the arm was already much swollen, he concluded not to apply immediately any splints.

On the third day he reduced the fragments as well as he could, and applied two right-angled splints, one on the palmar and one on the dorsal surface of the arm and forearm; with suitable compresses, rollers, &c. Also two small lateral splints.

These dressings he continued to the arm during a period of four or five weeks, when they were finally removed.

June 19, 1850, about nine months after the accident, the lad was brought to me for examination.

I found the fragments overlapped one inch. The upper fragment projecting in front, and the skin covering its sharp point being very thin and tender. The motions at the elbow-joint perfect. The hand was flexed forcibly upon the wrist; the first phalanx of all the fingers extended, and the second and third forcibly flexed; supination and pronation completely lost. The arm weak and

painful. The ulnar nerve could be felt lying across the projecting end of the bone.

In the hope that some favorable change might result to the hand by relieving the pressure upon the ulnar nerve, yet with not much expectation of success, I exposed the bone and removed the projecting fragments with a chisel and saw. The ulnar nerve had to be lifted and laid aside. The wound healed kindly, but the hand, one year from this date, remained in the same condition as before the operation.

The surgeon was subsequently prosecuted, but the case never came to trial.

CASE 41. *Simple fracture. Union with maiming and deformity of the forearm.*

B. G. McKay, of Skaneateles, æt. 4; left arm; Dr. Samuel Porter, of Skaneateles, well known throughout all that region as an eminent surgeon, took charge of the fracture.

I examined the arm twenty-three years after, and found a deformity at the point of fracture and at the elbow-joint, such as prevented complete supination of the forearm.

The forearm was also deflected outwards from the line of the arm several degrees. The arm had always been weak. The ulnar nerve is morbidly sensitive to this day, and the ulnar side of the forearm, with the ring and little finger, have always remained numb since the accident.

CASE 42. *Compound comminuted fracture. Union with deformity, &c.*

Mary Cotesworth, of Buffalo, æt. 2, fell down stairs, and broke her left arm just above the condyles, in May, 1853. The bone protruded in front an inch or more. Dr. Hackstein dressed the arm with light dressings. Violent inflammation ensued, and several small fragments of bone came out: the last fragment about six months after the accident.

Two weeks after the accident, May 30, 1853, I saw the patient with Dr. Hackstein. The wound was discharging copiously. Elbow and arm much swollen. We dressed it carefully with a splint well padded, and laid along the under side of the arm and forearm. The wound ceased discharging soon after the last fragment came out.

April 2, 1856, three years after the the arm was broken, I found the bone so smoothly united that I could not trace the line of fracture.

The humerus was shortened half an inch. The elbow was partially anchylosed, the forearm being extended at about an angle of 15° with the arm, and capable of being flexed through about 10° more; it was also forcibly proned. The elbow was occasionally painful, and the arm always weak.

CASE 43. *Compound comminuted fracture. Partial anchylosis, overlapping, &c.*

James Ashman, aged about 35, of Paris Hill, Oneida Co., N. Y. Drs. Knight and Bly dressed the fracture. A small fragment came out.

Three years after the accident, he was an inmate of the Buffalo Hospital. The humerus was shortened three-quarters of an inch, and the elbow could be flexed and extended only through two or three degrees of a circle.

CASE 44. *Oblique, comminuted, compound fracture. Union without deformity or shortening.*

Mr. ——, of Geneva, æt. 7. The bone was broken obliquely downwards and forwards. The lower end of the upper fragment was pushed through the skin an inch. Drs. Pierce and Ashly, of Lyons, N. Y., reduced and treated the fracture with a right-angled splint; declaring to the parents that anchylosis was to be anticipated. About one year after this a small fragment of bone escaped. After seventeen years, there remains no indication of where the fracture occurred, and the motions of the joint are perfect.

Internal Condyle.

CASE 45. *Simple fracture of apophysis. Result perfect.*

George Bull, of Buffalo, æt. 6, fell, July 27, 1849, and separated the apophysis from the internal condyle of the right humerus. Fracture did not extend into the joint. The fragment was displaced slightly.

I was immediately called, but applied no dressing. Aug. 3, I applied a paste bandage.

Dr. Silas Hubbard subsequently took charge of the patient.

April 7, 1856. I find the arm in every respect perfect, except that the apophysis is carried backwards about two lines, and upwards towards the shoulder about three lines; and it is a little more prominent than the apophysis on the opposite arm; the right elbow-

joint measuring three inches and three-quarters in its transverse diameter, and the left three and a half. He says the arm was well in eight weeks.

CASE 46. *Simple fracture. Result perfect.*

Bernard Smith, æt. 12, broke the internal condyle of the humerus. It was dressed by a surgeon. For six months or more, it was nearly anchylosed. The anchylosis gradually yielded, and thirty-eight years after the accident, when I examined the arm, the motions of the joint were perfect. It has, however, been occasionally painful to the present time.

CASE 47. *Simple fracture, probably not extending into joint. Result perfect.*

Charles Clark, of Buffalo, æt. 11, fell, October 9, 1848, and struck on the internal condyle of the left humerus. He came immediately to my office. The internal condyle was loose, and motion produced a distinct crepitus.

I do not think the fracture extended into the joint. He could flex and extend the arm perfectly, and rotate the forearm.

I applied a right angled splint, which I removed at the end of five weeks.

Three months after he could nearly straighten the arm, and all its motions were nearly perfect.

CASE 48. *Simple fracture. Anchylosis, etc.*

George Strong, of Ellory Centre, N. Y., æt. 6, fell and struck on his elbow.

The patient was seen by three excellent physicians in succession; but they did not agree as to the nature of the accident. The first two regarded it as a fracture, and applied splints. The third regarded it as a dislocation, and having removed the splints, and, as he supposed, reduced the dislocation, he put the arm in a sling.

Three months after the injury was received he called upon me. The inner condyle was very prominent, and surrounded at its base with callus. The arm was nearly anchylosed in a rectangular position. Pronation and supination perfect.

CASE 49. *Simple fracture, with displacement; temporary anchylosis, &c.*

Ed. E. Kendall, of Phillipston, Mass., æt. 9, broke the inner con-

dyle of the right arm. Dr. Stone, of Phillipston, was in attendance. Sixteen years after the accident, while Mr. K. was a student of medicine, I examined the arm. The internal condyle was displaced forwards. For about one year after the injury the elbow was quite stiff. Its motions are now perfect.

CASE 50. *Simple fracture.*

Michael Kelly, of Buffalo, æt. 14, fell with his right arm under him. Dr. Ring was called. By request of Dr. Ring, I saw the arm on the same day. The inner condyle was movable, and occasionally we could detect crepitus. We dressed the arm with a right angled splint. I have not been able to ascertain the result.

CASE 51. *Simple fracture of apophysis of condyle. Resulting in deformity.*

Francis Clifford, of St. Catharines, C. W., æt. 15, fell, in wrestling, with his right arm under him, Dec. 22, 1855.

The arm was seen by Dr. Henry Goodman, of St. Catharines, C. W., and treated by him. March 18, 1856, three months after the accident, the lad was brought to me by his father, and they made the following statement:—

"Dr. Goodman said the bones were dislocated inwards, and by pulling and manipulation he reduced them. The elbow was then greatly swollen. He applied no splints, but only treated the arm in such a way as to subdue the inflammation.

"Subsequently it was seen by another surgeon, in Canada, who believed that the ulna was at the time of the accident displaced inwards, and that it still remained unreduced. Dr. Theophilus Mack, a distinguished surgeon of St. Catharines, had also seen the arm, and did not think the ulna was now out of place, but that the inner condyle was broken off."

I find a fragment—the apophysis of the internal condyle—broken off, and removed downwards towards the wrist one inch and a quarter, where it is immovably fixed.

The elbow is partially anchylosed, so that it cannot be straightened completely nor flexed to a right angle. Pronation and supination are perfect. Dr. Mack had endeavored to overcome the anchylosis by moderate force applied gradually by means of a splint, but he had thus far been unsuccessful.

The father had already commenced an action against Dr. Goodman for damages.

It is quite certain that the articular surfaces are not now displaced. Whether they were displaced originally it is, of course, impossible for me to say. Whether they were or were not, I do not understand how the surgeon is to blame for not recognizing this fracture when the limb was so much swollen, nor do I believe that he could have prevented the displacement of the fragment if he had discovered the fracture. It is very probable, also, that the lad will ultimately have a fair use of his elbow-joint; and all this I felt it my duty to state to the parties, to which the father replied only that he could not afford to have his son lose the use of his arm!

CASE 52. *Simple fracture; resulting in anchylosis, &c.*

Noyes Atwood, of Lancaster, æt. 11, fell from a horse, striking on his left elbow. Dr. Potter, of Lancaster, dressed the fracture. Five weeks after the accident he consulted me. The inner condyle is displaced upwards three-quarters of an inch. The olecranon process has followed this fragment. Large amount of callus in front at seat of fracture. The elbow is nearly anchylosed at an obtuse angle.

March 10, 1856. More than a year after the accident, the elbow remains partially anchylosed. He cannot carry his hand to his mouth except by bending his head forwards.

CASE 53. *Simple fracture, with displacement, slight maiming, &c.*

Franklin, Barrows, of Attica, æt. 9, fell and broke left internal condyle. It was dressed by a regular surgeon. Six years after the accident, while Mr. B. was a student of medicine, I examined the arm. The internal condyle is displaced downwards towards the wrist half an inch. Cannot straighten the arm completely. Can only flex it slightly, the elbow being nearly fixed at an obtuse angle. The power of pronation and supination imperfect. He thinks the arm is as strong as before.

CASE 54. *Fracture extending into joint; complicated with displacement of ulna. Result imperfect.*

Philip Yout, of Buffalo, æt. 8, fell, July 8, 1849, striking upon the right side and arm. A Catholic priest first attempted to reduce it; but on the morning following the child was brought to me.

The elbow was then considerably swollen, and the diagnosis was rendered somewhat difficult. It became quite certain, however, when Mr. Otis and myself had completed our examination, that it

was a fracture of the internal condyle extending into the joint. The ulna fell easily into the space between the fragments, and could only be retained in its natural position by force.

I dressed the arm with an angular splint, constructed with a movable joint, and directed cold water to be applied to the dressings.

On the 11th I removed the splint, finding it painful, and left the arm on a pillow with only cold water dressings.

15*th*. I applied the starch bandage. The patient eventually recovered with a stiff elbow.

I subsequently learned that this same elbow had been broken before, and that the joint had been partially anchylosed for some years.

CASE 55. *Fracture complicated with a dislocation, slight maiming, and deformity.*

David Hersee, of Williamsville, N. Y., æt. 18, fell from a tree. Dr. Ham, of Williamsville, in attendance. Dr. H. found a dislocation of the radius and ulna of the right arm, with also a fracture of the inner condyle extending into the joint.

Five years after, I found the radius and ulna in place, but the inner condyle displaced downwards and forwards half an inch. The condyle is very broad and flat. When the arm is extended, the forearm is deflected to the radial side.

This arm tires sooner than the other. In all other respects its functions and condition are natural; but for about a year the elbow was quite stiff.

External Condyle.

CASE 56. *Simple fracture. Union with deformity.*

Patrick Whalin, of Buffalo, æt. 4, fell on the door-steps in September, 1854, breaking the external condyle of the left, humerus. The fracture extended into the joint near its middle. He was taken to the hospital; Drs. Winne and Smith in charge. For several days measures were taken to subdue inflammation, but no splints applied. September 28, Dr. Smith applied two right-angled pasteboard splints, well padded with cotton.

One year after the fracture I find the external condyle very prominent, being thrust to the radial side of the arm, and neither forwards nor backwards. The whole forearm is strongly deflected to the ulnar side. All the motions of the elbow-joint are nearly perfect,

as well as pronation and supination of the forearm. The olecranon seems to have been carried a very little, perhaps three lines, inwards upon the inner condyle; while the head of the radius is carried to the radial side with the external condyle. The remarkable inclination of the forearm to the ulnar side only exists when the forearm is extended upon the arm. When it is flexed no such distortion is present.

CASE 57. *Simple fracture. Union with deformity.*

Rollin Banta, of Buffalo, æt. 5, fell, July, 1852, and struck upon the left elbow, breaking off the outer condyle of the humerus; the fracture extending obliquely into the middle of the joint. Dr. Mixer was called and dressed the arm. On the 30th of July, some three or four days after the accident, Dr. Mixer requested me to see the case with him. The nature of the injury was apparent, and we informed the parents of the probability of anchylosis.

Adjusting the fragments as well as we could, we applied a gutta-percha splint to the arm and forearm, having fitted it accurately and padded it sufficiently.

I saw the lad again September 3, and we removed the dressings.

April 1, 1856. Nearly four years after, I find the elbow admitting pretty free motion, so that he can straighten the forearm to within about ten degrees, and can flex it nearly as perfectly as the other. Pronation and supination are perfect. There is, however, a considerable projection of the external condyle; this elbow being half an inch wider than the other, but its circumference is the same. The whole forearm is deflected slightly to the radial side. He often complains of a pain in the middle of the back of the joint, in the seat of the fracture. The outer condyle is neither carried forwards nor backwards, but is only spread outwards, or to the radial side, carrying the head of the radius with it.

When this arm first came out of the dressings we could see scarcely any deformity, but as the swelling gradually subsided it became more apparent, and it even led us to suspect, at one time, that the condyle was expanding under an inflammatory action.

CASE 58. *Simple fracture. Union with deformity.*

Rachel Wright, of Buffalo, æt. 88, fell in March, 1852, striking upon her elbow. She was carried to the watch-house, and the arm was dressed by Dr. Gray. Subsequently she was removed to the almshouse, and Drs. Winne and Forbush were in attendance.

Two months after the accident, I found the outer condyle removed half an inch from its natural position, producing at the elbow-joint a striking deformity. She was unable to straighten the arm perfectly.

CASE 59. *Simple fracture. Union with deformity.*

John R. Dobbins, of Erie, æt. 7, fell on left arm, in March, 1851, breaking the outer condyle of humerus. Dr. C. Brandis, of Erie, and Dr. Wood, of the navy, were in attendance.

Eleven weeks after the accident he was brought to me. The forearm was then nearly at a right angle with the arm, and the elbow admitted of only very slight motion. Pronation and supination were perfect.

Dec. 20, 1855, nearly four years after the accident, I find the forearm not quite straightened out, but nearly so, and the motions of the elbow-joint very extensive. When he attempts to straighten the arm the forearm is deflected outwards. The head of the radius, also, seems to press forwards as if the condyle upon which it rests was carried in this direction. His arm is as strong and as useful as the other.

CASE 60. *Simple fracture. Union with deformity, &c.*

June 22, 1847, a son of Daniel Hodge, of Buffalo, æt. 8, fell several feet, striking on the left side and arm. Dr. George Burwell being called, requested my attendance, also, in consultation.

We found a distinct crepitus in the elbow-joint, and the motions of the fragments were plainly felt. Flexion and extension at the elbow-joint were unimpaired. Rotation of radius not painful. Flexion slightly painful. When the external condyle was seized between the thumb and finger, and moved forwards or backwards the radius also moved with it. The external condyle projected laterally and a little backwards, so that the elbow measured one-quarter of an inch more in diameter than the opposite.

We dressed the arm with Rose's right-angled splint, placing the splint at an angle greater than a right angle, and laying it upon the palmar surface. We used, also, pads with rollers, &c.

August 18, two months after the accident, the fragment was united, but the elbow was quite stiff, allowing very little motion. The external condyle remains as at first.

CASE 61. *Simple fracture. Union with deformity.*

E. R., æt. 5, fractured the outer condyle of the humerus. It was

dressed, he says, by a surgeon. I examined the arm in the Auburn State Prison, in the presence of the prison surgeon, after the lapse of twenty years.

The broken condyle projects unnaturally, and the humerus at this joint is half an inch wider than the humerus of the other arm. He cannot straighten the arm perfectly. Occasionally the joint is painful.

CASE 62. *Comminuted fracture. Non-union of fragments, but no maiming.*

Henry Gilbert, of Evans, Erie Co., N. Y., æt. 5, was thrown from a horse, August 8, 1855, breaking the external condyle of the humerus. Dr. ——, of Evans, dressed the arm temporarily and sent the lad to me. Dr. Boardman and myself examined and reduced the fracture, as well as we were able to do, about sixteen hours after the accident. We administered chloroform freely, to enable us to make a more satisfactory examination. There were two fragments, and each quite movable. The principal fragment was thrown forwards whenever the arm was flexed to a right angle. We concluded, therefore, to drop the arm and forearm in a position nearly straight, or only slightly flexed. We employed carefully moulded and well padded gutta-percha splints, made fast with the paste bandages.

April 10th, 1856, eight months after the accident, the motions of the arm are free and its strength unimpaired, but a fragment of the outer condyle is not united, except by ligament. It moves freely backwards and forwards when the arm is extended or flexed.

CASE 63. *Simple fracture. Complicated with dislocation of the head of the radius backwards.*

Frederick Keaffer, of Buffalo, æt. 11, fell from a load of hay. Drs. Blanchard and Tilden, both botanic and eclectic physicians, were first called. Dr. Rochester subsequently examined it.

Six hours after the accident he was brought to me. Left arm very much swollen. The external condyle could not be distinctly felt, but on pressing with my finger over its usual seat, there was a crepitus. The head of the radius was plainly dislocated backwards, and separated entirely from the condyle; its smooth button-like head being very prominent. There was great lateral mobility of the elbow-joint. The forearm was prone and fixed in a position

slightly flexed. Every attempt to flex or extend it beyond this was very painful.

The fall was received upon the back of the elbow. It is difficult to conceive how a blow from behind should leave the head of the radius dislocated backwards, or how the radius could have separated from the broken condyles, but I think there is no doubt of the fact. Such was the conclusion to which Prof. Rochester had previously arrived, after a very thorough examination, and after an attempt to reduce and retain the fragments in place, made while the lad was under the influence of chloroform. I administered ether, and after a full examination, attempted a reduction of the displaced radius. This was easily accomplished, but the bone was instantly displaced when the pressure was removed. The inflammation was such as not to warrant the immediate application of splints.

Dr. Blanchard subsequently took charge of him.

May 17, 1856, about one year after the accident, I examined the arm. The head of the radius remains dislocated backwards. The external condyle cannot be distinctly felt, but so far as it can be traced nothing abnormal can be discovered. The motions of flexion and extension, of pronation and supination are as complete as before the injury was received, except that the forearm cannot be quite as perfectly extended. The arm is not quite as strong as the other.

Between the Condyles.

CASE 64. *Simple fracture. Union with shortening and maiming.*

J. R. Snow, of East Vienna, Wayne Co., N. Y., æt. 3, broke the left humerus by a fall from a rocking-chair. Dr. Bush, of East Vienna, dressed the arm within an hour.

Eighteen years after the accident, when he was a student of medicine at Buffalo, I examined the arm. The humerus was shortened three-quarters of an inch, and the condyles separated half an inch. The internal condyle was particularly prominent. He cannot straighten the arm completely. Motion produces a grating sensation in the elbow-joint, and occasionally the elbow-joint becomes tender and painful. The muscles on the arm are wasted, but those of the forearm are not.

CASE 65. *Simple fracture. Union with deformity.*

Patrick O'Brien, of Buffalo, æt. 10, was kicked on his left arm

by a horse. Dr. M., of Montezuma, N. Y., examined the arm, and said it was out of joint. After a full bleeding, he attempted reduction, and then applied woollen rollers. Twelve days after, he came under my care. The elbow was much swollen and slightly bent. On pressing the condyles together, a crepitus was distinctly felt. The ulna seemed slightly displaced inwards and backwards. Dr. Sprague concurred with me in the opinion that it was a fracture through the condyles into the joint.

I applied an angular splint, with compresses, bandages, &c.

On the 25th day (Aug. 14, 1848), the fragments were not in place, nor could they be made to keep their places.

April 4, 1856. Seven years after the fracture occurred, he can extend the left forearm completely, but cannot flex it quite as much as he can the right. Pronation and supination perfect. The ulna is displaced inwards so much as to conceal entirely the prominence of the internal condyle. The head of the radius is in its socket, but the external condyle is pushed outwards, and with it the radius. The elbow is half an inch wider than the opposite. When he extends the arm, the forearm is deflected inwards (to the ulnar side) at an angle of about 20° or 25°, but when the arm is flexed, the forearm resumes its natural position. The humerus is shortened half an inch. It is occasionally painful across the back of the joint. The arm is not quite as strong as the other, nor as large. He is a ship-builder, and works at his trade.

CASE 66. *Comminuted fracture. One fracture being just above the condyles, and another extending into the joint in such a manner as to separate the inner condyle. Resulting in deformity and maiming.*

Mrs. A. B. Halifax, of Buffalo, æt. 44, fell upon the sidewalk, Jan. 22, 1850, and broke her right arm at the elbow-joint. I was immediately called, and, although the elbow was considerably swollen, the nature of the fracture was pretty evident. The fragments were easily reduced; indeed, the condyle was never displaced. I applied an angular splint, with gutta-percha side splints, &c. &c. No efforts were spared with the limb to make it perfect.

Seven months after the accident, the elbow was nearly anchylosed at a right angle.

April 3, 1856. Six years after the fracture, I examined the arm again. She could now nearly straighten the arm, and flex it almost as much as the other. She could also nearly shut the fingers, but not quite. No deformity at the seat of fracture, nor shortening of

the humerus. There was, however, much tenderness over the point of fracture in the shaft of the humerus, and just above the internal condyle, and also where the head of the radius articulates. There was, moreover, a grating sensation occasionally in that joint. She experienced frequent pains in the arm, and especially along the back and radial border of the ring finger. Her hand was weak. During a year or two after the accident, her arm perished very much; but it was now nearly, but not quite, as large as the other. I think, however, the inner condyle is about one-quarter of an inch lower (towards the wrist) than the corresponding process upon the opposite arm. Pronation and supination are perfect.

CASE 67. *Compound comminuted fracture. Union with anchylosis, &c.*

Horace Utley, of Buffalo, æt. 35. Mr. U. was struck by the tongue of a carriage with which a couple of horses were running. The blow was received directly upon the back of the left elbow.

Dr. Sprague and myself were in attendance. We removed some small fragments of bone, and then laid the arm and forearm upon a well-padded splint, to which they were only loosely secured by bandages, &c. We sought only to keep the limb quiet, and to combat inflammation. It was several months before the discharge of matter from the wound ceased.

Seven years after the accident, the forearm was considerably flexed upon the arm, and almost completely anchylosed.

April 3, 1856. Twelve years after the injury was received, the motions of flexion and extension are so far restored that he can extend the forearm to an angle of about 45°, and flex it to a right angle; at this point it seems to strike a solid body like bone. Rotation of the forearm is completely lost, the hand being in a state midway between pronation and supination. Humerus shortened one inch and a half. He has no pain in the arm or hand, nor is the arm weak. He says that during the first year there was no motion in the elbow-joint. No means have been employed to restore its functions, except passive motion, and subsequently constant use of the limb.

Cabinet Specimens.

Upper Third.—Anatomical Neck and Head of Humerus.

Specimen 1. Boiled specimen. Adult. United by bone. Irregular deposits of bone. Head of the bone flattened close to the tuberosities. History unknown. (Henry H. Smith, Philadelphia.)

Specimen 2. Boiled. Adult. Irregular callus. Shaft completely rotated by action of the scapular muscles, so as to turn the back of the humerus forwards. Tendon of biceps also displaced. There is also a fracture of the shaft near its middle. History unknown. (Henry H. Smith, Philadelphia.)

Specimen 3. Dried. Adult. Partly through neck, and partly through the tuberosities. The greater tuberosity being attached to the shaft, and the lesser to the head. United by bone, and with very little ensheathing callus. There is a slight impaction of the fragments. History not known. (Henry H. Smith, Philadelphia.)

Specimen 4. Adult. Partly through anatomical neck. The fracture was produced by a severe injury. Suppuration ensued, and about one year after, Dr. Brainard removed the fragment. It was loose, necrosed, and partially absorbed or macerated. He has recovered a pretty useful arm. (Daniel Brainard, Chicago, Ill.)

Specimen 5. Adult. Partly through anatomical neck. Injury produced by a railroad car. Suppuration. About three months after the accident, Dr. Brainard extracted the principal part of the head of the bone. Patient recovered with a very useful arm. (Daniel Brainard, Chicago.)

Specimen 6. Macerated. Adult. Broken at the junction of the head with the shaft, and then irregularly transverse through the tuberosities, to a point half an inch below the greater tuberosity. No union. History unknown. (Charles A. Pope, St. Louis, Mo.)

Specimen 7. Similar to No. 6, but fracture terminating three quarters of an inch below the greater tuberosity. No union. History unknown.

Dr. Pope remarks of the above cases (6 and 7): "These are not cases of detachment of the epiphyses, as the bones are evidently those of adults; and there is at their lower extremities, above the condyles, no trace of an epiphysary line." (Charles A. Pope, St. Louis, Mo.)

Specimen 8. Macerated. Adult. Broken along the line of union of the head with the body, and also through the surgical neck. The upper fracture is oblique and the lower transverse, and both are united by bone. The upper fragment, or head, has suffered an extraordinary displacement or revolution, so that its articular surface is turned downwards against the head of the bone, and has in this position become firmly united to the shaft; while the broken surface of the head is turned upwards, and is articulated with the glenoid cavity of the scapula. There is also a peculiar curve of the upper fourth of the shaft of the bone; the head, however, remains in the general axis of the body. History unknown. (Charles A. Pope, St. Louis.)

Specimen 8. Dried. Adult. Fragment slightly displaced, but united by bone. (Charles Gibson, Richmond, Va.)

Specimen 9. Dried. Adult. Fracture nearly transverse. The head has united by bone, but at right angles with the shaft. (Chas. Gibson, Richmond, Va.)

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
UPPER THIRD (Separation of Epiphysis).											
1	13 m.	5 m.	M.	L.	Simple	Sling, &c.	N. U.			Cannot raise his arm.	Imp.
Surgical Neck.											
2	65 y.	1 y.	M.	R.	Simple	No dressings after the first week.	U.				P.
3	62 y.	2 m.	M.	R.	Simple	One long gutta percha splint.	U.				P.
4	12 y.	4 m.	M	L.	Simple	One long gutta percha splint, &c.	U.	21 d.	1 in.	Motions of shoulder joint unimpaired, but lower fragments projecting forwards, &c.	Imp.
5	43 y.	2 y.	M.	R.	Simple		N. U.		1 in.		Imp.
6	15 y.	10 m.	M.	L.	Simple	Lateral splints, &c.	U.	10 d.	1½ in.	Motions of shoulder joint unimpaired, but fragments projecting forwards.	Imp.
7	30 y.	6 w.	M.	L.	Compli-cated	Lateral splints, pad in axilla, &c.	U.	6 w.		Motions of joint perfect.	P.
8	23 y.	6 w.	M.		Compli-cated	Lateral splints.	U.	6 w.		Very slight bend.	P.
Shaft (Upper Third).											
9	64 y.	3 y.	M.	R.	Simple trans-verse	Lateral splints and paste bandage.	U.			A case of fragilitas ossium; 18 months after, he broke the left humerus in its lower third; again he broke his right arm in its middle after 18 mos.	P.
10	11 y.	8 w.	M.		Simple	Lateral splints.	U.	8 w.			P.
11	30 y.	2 m.	M.	L.	Simple and ob-lique	Extension during three days; lateral splints; paste bandage.	U.	38 d.		Complicated with delirium tremens.	P.
12	38 y.	6 m.	M.	L.	Simple and ob-lique	Lateral splints.	U.	5 m.	¼ in.	Use of limb perfect.	Imp.
13	35 y.	22 d.	M.	R.	Compli-cated	Lateral splints; gutta percha and paste splints.	N. U.			Died on 22d day.	Imp.
Middle Third.											
14	56 y.	1 y.	M.	R.	Simple	Lateral splints.	U.				P.
15	18 y.	25 y.	M.	L.	Simple	Lateral splints, &c.	U.				P.
16	Birth	10 m.	F.	L.	Simple and trans. congeni-tal	Lateral splints.	U.	14 d.			P.
17	45 y.	1 y.	M.	R.	Simple and trans. syphi-litic		U.	4 m.			P.
18	63 y.	2 y.	M.	R.	Simple		U.		1 in.		Imp.
19	33 y.	30 y.	M.	L.	Simple	Lateral splints.	U.		½ in.		Imp.
20	13 y.	5 w.	M.		Simple and oblique		U.		¼ in.		Imp.
21	35 y.	6 m.	M.	R.	Simple		N. U.			Anchylosis.	Imp.
22	35 y.	6 m.	M.	L.	Simple	At first, right angled splint; subsequently, straight position.	U.			Union delayed.	P.
23	30 y.	2 m.	M.	R.	Commi-nuted	Long gutta percha splint, sling, &c.	U.				P.

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
ABOVE BASE OF CONDYLES (LOWER THIRD).											
24	55 y.	2 y.	M.	L.	Simple	Lateral splints.	U.			Fragilitas ossium.	P.
25	3 y.	3 m.	F.	R.	Simple		U.				P.
26	4 y.	20 y.	M.		Simple		U.				P.
27	18 y.		M.		Simple	Starch and pasteboard splints.	U.	30 d.	¼ in.		Imp.
28	32 y.	15 y.	M.	R.	Simple		U.			Slight anchylosis.	Imp.
29	40 y.	4 y.	M.		Simple and oblique	Lateral splints.	U.	40 d.		Elbow was stiff a long time; motions now nearly restored.	Imp.
30	7 y.	15 y.	M.	L.	Simple	Lateral splints.	U.		½ in.	Arm bent, weak, and some wasted.	Imp.
31	30 y.	1 m.	M.	L.	Simple and ob.	Lateral splints.	U.	30 d.	1½ in.		Imp.
32	30 y.	2 m.	M.	R.	Commi-nuted	Long gutta percha splint, sling, &c.	U.				P.
33	30 y.	6 m.	M.	L.	Com-pound	Angular splint.	N. U.		½ in.	Unsuccessful attempt to unite the bones by an operation.	Imp.
34	25 y.	2 y.	M.	R.	Com-pound, commin. and complic.		U.		1 in.	With unreduced dislocation of shoulder joint.	Imp.
BASE OF THE CONDYLES.											
35	6 y.	3 y.	M.	R.	Simple and ob.	Felt and paste.	U.	11 d.			P.
36	4 y.	3 m.	M.	R.	Simple and ob.		U.	28 d.		Partial anchylosis.	Imp.
37	6 y.		M.	R.	Simple		U.				
38	60 y.	7 m.	M.	R.	Simple		U.		½ in.	Upper fragment behind lower; anchylosis, &c.	Imp.
39	9 y.	2 m.	M.		Simple		U.				Imp.
40	8 y.	1 y.	M.	L.	Simple and oblique	Right-angled splint.	U.		1 in.	Great deformity and paralysis of arm; prosecution.	Imp.
41	4 y.	23 y.	M.	L.	Simple		U.			Deformity; pain, numbness, &c., after 23 years.	Imp.
42	2 y.	3 y.	F.	L.	Com-pound, commin.	Splints, &c.	U.	6 m.	½ in.	Anchylosis, &c.	Imp.
43	35 y.	3 y.	M.		Com-pound, commin.		U.		¾ in.	Partial anchylosis.	Imp.
44	7 y.	17 y.	M.		Com-pound, commin.		U.				P.
INTERNAL CONDYLE.											
45	6 y.	7 y.	M.		Simple, apophy-sis	Paste bandage after 7th day.	U.				P.
46	12 y.	38 y.	M.		Simple		U.		–	Anchylosis for 6 mos.	P.
47	11 y.		M.	L.	Simple, apophy-sis	Right angled splint, &c.	U.				P.
48	6 y.	3 m.	M.		Simple and into joint		U.			Anchylosis.	Imp.
49	9 y.	16 y.	M.	R.	Simple		U.			Elbow stiff one year; fragment displaced forward; use of arm now perfect.	Imp.
50	14 y.		M.	R.	Simple						

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
					INTERNAL CONDYLE—*Continued.*						
51	15 y.	3 m.	M.	R.	Simple; apophysis	No splints.	U.			Fragment displaced downwards 1½ inches; partial anchylosis; prosecution, &c.	Imp.
52	11 y.	1 y.	M.	L.	Simple and into joint		U.			Fragment displaced upwards ¾ inch; anchylosis.	Imp.
53	9 y.	6 y.	M.	L.	Simple; apophysis		U.			Fragment displaced downwards ¼ inch; anchylosis, &c.	Imp.
54	8 y.		M.	R.	Simple and into joint	Angular splint, starched bandage, &c.	U.			Anchylosis.	Imp.
55	18 y.	5 y.	M.	R.	Into joint; complicated with dislocation		U.			Fragment displaced downwards and forwards ¼ in.; deformity.	Imp.
					EXTERNAL CONDYLE.						
56	4 y.	1 y.	M.	L.	Simple: into joint		U.			Condyle projects to radial side; forearm deflected to ulnar side; very little anchylosis.	Imp.
57	5 y.	4 y.	M.	L.	Simple; into joint	Gutta percha, &c.	U.			Condyle projects to radial side; forearm deflected to radial side; anchylosis.	Imp.
58	58 y.	2 m.	F.		Simple		U.			Condyle displaced 6 lines; anchylosis.	Imp.
59	7 y.	4 y.	M.	L.	Simple		U.			Condyle projects a little forwards, and forearm is deflected outwards; very slight anchylosis.	Imp.
60	8 y.	2 m.	M.	L.	Simple	Angular splint.	U.			Condyle projected to radial side and a little backwards; anchylosis.	Imp.
61	5 y.	20 y.	M.		Simple		U.			Condyle projects to radial side; partial anchylosis, &c.	Imp.
62	5 y.	8 m.	M.		Comminuted	With arm nearly straight.	N. U.			One fragment not united; use of arm perfect.	Imp.
63	11 y.	1 y.	M.	L.	Complicated with dislocation of radius backwards		U.			Motions of arm perfect, but radius remains unreduced.	Imp.
					BETWEEN THE CONDYLES.						
64	3 y.	18 y.	M.	L.	Simple		U.			Arm shortened ¾ inch; internal condyle projects; partial anchylosis.	Imp.
65	10 y.	7 y.	M.	L.	Simple	Angular splint.	U.			Condyles spread, and internal condyle carried backwards and inwards; forearm deflected inwards.	Imp.
66	44 y.	6 y.	F.	R.	Comminuted	Angular splint; gutta percha, &c.	U.			Slight anchylosis, &c.	Imp.
67	35 y.	12 y.	M.	L.	Compound, commin.		U.			Partial anchylosis, &c.	Imp.

REMARKS.

Of sixty-seven fractures of the humerus, thirteen occurred through some portion of the upper third, ten through the middle third, and forty-four through the lower third. Or, if we reject fractures of the head and condyles, twelve occurred through the upper third, ten through the middle third, and twenty-one through the lower third. An observation which is in contrast with the statement made by Amesbury, and which has been repeated by Lizars, B. Cooper, Fergusson, Gibson and others, that the most common situation of fractures of the humerus is through the middle third of the bone.

Of the fractures of the upper third, one was a fracture through the tuberosities, or a separation of the epiphysis. In this case union had not occurred five months after the injury was received, and the arm was nearly powerless. Seven occurred through the surgical neck, of which four have resulted in perfect limbs, and three are more or less deformed; but of the whole number only five were ever displaced, and of these five only two are perfect. In two of the imperfect cases, both fragments are displaced forwards; in one union has not occurred, and the lower fragment is also displaced forwards. In none of the cases, except where union has not occurred, are the functions of the arm impaired.

The proportion of the cases in which the fragments were displaced at first, is much greater than was observed by Malgaigne, who remarks that in more than twenty cases that he had seen there were but two examples of sensible and recognizable displacement; in a great majority of cases the fragments being retained in place by the resistance of the periosteum and of the long tendon of the biceps.

In three of my cases the lower fragment is displaced forwards, and in one case the upper fragment is thrown in the same direction. Desault has seen them both thrown backwards, Dupuytren, Paletta, Duret and others, have seen them pushed outwards. Others still more frequently have seen the fragments directed forwards; and Sir Astley Cooper declares that with infants this direction is constant; a statement which Malgaigne calls in question, he having seen the lower fragment most often drawn inwards towards the axilla. Others have observed that the lower fragment is generally drawn inwards while the upper is carried outwards, an observation which I have not confirmed.

With the exception of the two lads, one of whom was twelve years old, and the other fifteen, all the cases occurred in adults, and two in the persons of old men. This accords more nearly with the observations of Malgaigne than of Sir Astley Cooper. Sir A. Cooper declaring these fractures to be most common in infancy, while Malgaigne has never seen a case in a person under fifty-three years.

In addition to these two forms of fracture of the upper end of the humerus, in illustration of which I have furnished the foregoing cases, other forms have been described by surgeons, such as, 1st. Fractures of the anatomical neck (intracapsular) and not impacted. 2d. Fractures of the anatomical neck and impacted. 3d. Fractures of the great tuberosity, or of both tuberosities. 4th. Extra-scapular fracture and impacted.

I have recorded only one case of separation of the epiphysis, and seven of fractures of the surgical neck, but not one of either of the other varieties. The museums in this country, however, it will be seen, furnish several specimens of all these varieties, if, indeed, I except fractures of the great and lesser tuberosities, of which particular accident I have no precise information or knowledge. For much that is new and valuable on this subject I will refer the reader to that excellent treatise on "Fractures in the Vicinity of Joints, &c.," by Dr. Smith, of Dublin; and I beg only permission in this place to quote a few of his conclusions, such as may be considered pertinent to the object of this paper.

"The following conclusions may, I think, be legitimately drawn from what has been stated in the preceding pages:—

"When there is much displacement of the tubercle, in consequence of the rupture of the fibrous and tendinous structures which invest it, ligamentous union is more likely to be the result than osseous.

"In the former it is generally the inferior fragment which penetrates the superior, while, in the latter, the head of the bone is driven into the lower fragment.

"The intracapsular impacted fracture is generally accompanied by a fracture of one or other, or of both tubercles, and is so far analogous to the extracapsular impacted fracture of the neck of the femur, with the fracture of one or other, or of both trochanters.

"Each variety is capable of uniting by bone.

"In the intracapsular variety, the circumstance of the fracture being accompanied by impaction, materially increases the probability of the occurrence of osseous consolidation.

"When osseous union occurs in this variety of fracture, the process of reparation is accomplished by the lower fragment principally.

"In the intracapsular fracture, without impaction, the head of the humerus may perish from want of nutrition.

"In such cases, disorganization of the joint may ensue, as the result of the processes, by which the elimination of the dead bone is accomplished.

"In the intracapsular fracture the head of the bone may become reversed in the articulation, and its cartilaginous surface be brought into contact with the broken surface of the lower fragment.

"In the intracapsular impacted fracture the deformity is greater than in the extracapsular.

"Each variety of the impacted fracture unites with deformity.

"In the intracapsular impacted fracture, the removal of the deformity would diminish the probability of the occurrence of osseous consolidation.

"The chief diagnostic signs of the separation of the superior epiphysis of the humerus, are, an abrupt projection beneath the coracoid process caused by the upper end of the lower fragment, and the immediate recurrence of the deformity when the means employed for its reduction cease to be in operation.

"There is no fracture incidental to the upper end of the humerus, in which it is more difficult to maintain the fragments in their proper relative position.

"The supposition that, in this injury, the tubercles form a portion of the lower fragment, involves an anatomical error, the line of junction of the epiphysis with the shaft being below these processes." (*A Treatise on Fractures in the Vicinity of Joints*, &c., by Robert Wm. Smith. Dublin, 1854, pp. 207–8.)

In two of the cases of fractures of the upper end of the humerus, mentioned as being found in our museums, suppuration ensued, and the necrosed bone was successfully removed by that distinguished operator, Dr. Brainard, of Chicago. In Specimens 6 and 7, also, no union occurred, but union by bone occurred in the remaining six.

Specimen 2, of double fracture, presents a curious turning of the shaft of the bone upon its axis in consequence of the action of the scapular muscles.

Specimens 8 and 10, owned respectively by Charles A. Pope, of St. Louis, and Charles Gibson, of Richmond, present the most *bizarre*

displacements. In the one case the head is completely reversed in the socket, and in the other it is set at right angles with the shaft. Displacements which find their parallel in a specimen of impacted fracture which Dr. Smith laid before the Pathological Society of Dublin, in 1843, and which he has particularly described in his work on *Fractures*, &c., pp. 193–196. Nélaton, also, p. 730, refers to a similar specimen which he has seen in the possession of M. Dubled. Smith mentions also a case, p. 197, in which the position of the head of the bone resembled specimen 10; and of this form of displacement, Nélaton, p. 730, says: "Malgaigne showed lately a specimen to the Academy. Indeed, I think it is, probably, the same which Malgaigne has himself described on p. 529 of his volume on *Fractures*, and which is represented in Pl. V. Fig. 2, of the same volume."

In specimens 1 and 2 alone is seen that irregular deposit of ensheathing callus, or those osteophites which are so commonly found on the margin of the lower fragment when the anatomical neck is broken. It will be remarked that these are the only cases recorded as intracapsular.

All of these fractures occurred in adults.

Perhaps no place will be more appropriate than this to speak of the difficulty of diagnosis in fractures about the joints, and especially in fractures occurring in the vicinity of the shoulder-joint; a difficulty so serious as to materially embarrass the surgeon in his prognosis, and which, it must certainly not be denied, diminishes the value of my own conclusions, as based upon my recorded cases. It is only, after all, by an examination of a great number of cases both before and after death, that we shall ever arrive at a complete solution of these difficult questions. To this point already the labors of Sir Astley Cooper, R. Smith, Key, and others have been especially directed, yet the constant mistakes committed to-day by the most experienced surgeons, not to speak of those acknowledged by Sir Astley himself, testify to the imperfection of our knowledge.

Says Nélaton, speaking of the fractures of the neck and head of the humerus: "Mais il n'est peut-être pas possible de distinguer entre elles les diverses variétés de cette fracture; Boyer, qui a plusieurs fois constaté par l'autopsie des fractures du col anatomique, dit que, pendant la vie des blessés, il lui avait eté impossible d'assurer du lieu précis où était située la fracture."[1]

[1] Elémens de Pathologie, tom. i. p. 731.

Says Mr. Johnson, in a review of a memoir entitled *Diagnosis of Dislocations and Fractures of the Upper Extremity of the Humerus*, by M. Le Baron Dupuytren, "It is perfectly undeniable that fractures of the upper extremity of the humerus, and dislocations of the head of that bone, especially dislocations into the axilla, are at times confounded with, and mistaken for each other, even by those whose experience is great; we allude to our hospital surgeons. If such mistakes, then, occur with those whose opportunities of practice are considerable, *à fortiori*, how much more frequent must they be amongst those who have few or no such opportunities, and in country practice in particular. The question, indeed, need not be begged, for the fact, as so put, is unhappily notorious."[1]

Dupuytren reports several cases, from the practice of Hôtel Dieu, which illustrate the difficulty of diagnosis. In one case, a case of fracture near the head of the bone, with, also, actual dislocation of the head inwards and forwards, Dupuytren, who saw the patient on the first day, diagnosed a fracture only; on the third day he was in doubt, and on about the eighth day he discovered the true state of things. It does not appear, however, that the dislocation was ever reduced. In a second case the surgeon who first saw the patient diagnosed a mere contusion. On the third day many at the Hôtel Dieu thought it a dislocation, but Dupuytren determined that it was a fracture of the head of the bone. In the third case, one year had elapsed since the occurrence of an accident which a surgeon called a dislocation, and which he believed he had reduced, but M. Breschet discovered that it had been a fracture, and that the fragments remained displaced. The fourth case was also supposed at first to be a dislocation forwards, which the surgeon believed he had reduced. Two other surgeons subsequently attempted reduction, under the impression that it was an unreduced dislocation, and at the end of a month he came to Hôtel Dieu, where the accident was recognized as a fracture with displacement. Case four was more remarkable still. The patient, Marie Valletier, fell and injured her left shoulder, on the 26th of Jan. A surgeon, to whom she applied the next morning, said that nothing was amiss. On the 28th, the surgeons at Hôtel Dieu discovered the head of the left humerus in the axilla. M. Dupuytren now ascertained, also, that she had a dislocation forwards of the right humerus, and a fracture of the right femur, both of which had occurred twelve

[1] Med.-Chir. Rev., vol. xiv, Analyt. Series (1828), p. 133.

years before, and having been overlooked by the surgeon, remained unreduced. In the fifth case, on the third day after the accident, M. Dupuytren himself believed at first it was a dislocation, but finally ascertained that it was a fracture. Two more cases are related, one in which the surgeons at Hôpital St. Louis mistook a fracture for a contusion, and one in which a private surgeon committed the same error, both of which Dupuytren corrected on the eighth day. To these the reviewer adds, also, two similar cases which had come under his own observation, in one of which the surgeon twice attempted reduction of dislocation of the shoulder, when, in fact, there was probably a fracture of the surgical neck. The fragments were left unreduced, and yet "this surgeon," he remarks, "deservedly ranks among the highest in town." An examination of the memoir shows, also, that even where Dupuytren was able to diagnose correctly these accidents, he was frequently unable to restore the displaced bones to position, or to retain them in place when reduced.

Mr. Key, in the ninth volume of the same journal, has recorded a case of fracture of the cervix humeri, which had been overlooked, and in which there was considerable displacement and non-union at the end of six weeks. He also declares "that it sometimes requires a very accurate examination to detect fracture of the cervix humeri, on account of the little displacement which occurs."

Says Mr. Smith: "It has been justly remarked by Dupuytren, that all solutions of continuity of bones in the vicinity of joints, give rise to numerous errors in diagnosis, and the observation applies with peculiar force to the injuries which occur in the immediate neighborhood of the scapulo-humeral articulation.

"Much, it is true, has been already done, both in this country and abroad, towards elucidating their nature, but every experienced surgeon can recall to his recollection cases of injuries of the shoulder, in which he has felt the utmost difficulty in arriving at a conclusion as to the nature of the accident."[1]

I have multiplied these quotations because it has occasionally happened to me to see the surgeon severely blamed for errors of diagnosis in relation to injuries about this joint, and also because I would like to impress upon surgeons the necessity of studying the diagnostic signs of these various accidents with great care. If any are inclined to this study, I would refer them especially to the memoir of Dupuytren, already quoted, to the excellent treatises of

[1] Op. cit., p. 176.

Sir Astley Cooper and Robert Smith, and to the two volumes of Malgaigne, which treat respectively of fractures and of dislocations.

The remaining five cases of fractures through the upper third, occurred below the surgical neck; of these, three cases are recorded as perfect, and two as imperfect. Of the perfect, Case 9 was a transverse fracture occurring from muscular action, and was connected with a fragilitas ossium. This patient had subsequently the same arm broken through its middle third (Case 14), and, still later, the opposite arm through its lower third (Case 24). There was no tendency in either case to lateral displacement, consequently no overlapping of the fragments, the soft tissues immediately about the bone being but little, if at all, disturbed. Case 17 occurring in the middle third, a result of secondary lues, presented also the same peculiar features.

Of the two imperfect cases one was complicated, and the patient died of tetanus on the 22d day; and in the other, union was delayed five months, but the bone having finally united with slight shortening, the use of the limb was unimpaired; so that of these five patients, all, except the one who died, recovered eventually the perfect use of their arms.

Of the forty-four fractures of the lower third, ten occurred through the shaft at the base of the condyles, eleven higher up, eleven through the internal condyle, eight through the external condyle, and four across the shaft and through the condyles at the same time.

Of the fractures of the shaft above the base of the condyles, four are perfect, and seven imperfect; of the four perfect, one was a case of fragilitas ossium, already alluded to, and two occurred in infants.

Of the seven imperfect results, one is without union, five are with more or less anchylosis of the elbow-joint, and five are shortened.

In Case 31 the lower fragment is in front of the upper fragment. The arm was broken obliquely at two points in Case 32, but it has united without shortening or deformity.

Of the ten fractures occurring just above the condyles ("fractures de l'extrémite inférieure de l'humerus" of Dupuytren, and "fractures sus condyliennes de l'humerus" of Malgaigne), eight occurred in children under nine years of age, and some of them may have been separations of the lower epiphysis. In five instances the upper fragment was found at the time of the fracture or sub-

sequently, in front of the lower; in one case only, Case 38, the opposite condition is remarked.

Seven still continue imperfect; and at periods, since the fractures, varying from two months to twenty-three years, six are more or less anchylosed. In one case only is the anchylosis complete.

The eleven fractures of the internal condyle ("trochlea and epitrochlea" of Chaussier) occurred in children between the ages of six years and eighteen; of the whole number four are known to have been fractures of the condyle outside of the joint, or fractures of the apophysis, ("epitrochlea"), and four are known to have entered the joint (fracture of the "trochlea"). Of the fractures of the apophyses two are recorded as imperfect, because there remains a partial anchylosis; and two as perfect, because no anchylosis exists. In three of the four cases there was, however, a permanent displacement of the apophysis. In one instance, it is displaced slightly upwards and backwards, and in two cases it is very much displaced downwards.

This is the fracture, a fracture of the epitrochlea, which Granger first described in the *Edinburgh Med. and Surg. Journal*,[1] and which he thinks is produced by inordinate muscular action, and not by a blow received directly upon the elbow. I do not clearly understand what direction the displaced fragments usually took in the cases seen by him, but I presume that they were carried directly downwards, or perhaps in some cases slightly forwards or backwards, since while he always speaks of their being "retracted below the elbow-joint," he mentions also that in some cases the fragments rest in contact with the olecranon, and in some cases they are an inch removed from this process. It is only by this lateral, or backwards displacement, also, that any pressure could have been exercised upon the ulnar nerve, a circumstance which he met with no less than three times: in each of which three cases there was a numbness of the parts supplied by the ulnar nerve, accompanied with vesications. In Case 45, reported by myself, the epitrochlea seems to be carried very slightly upwards, as well as a little backwards, but in all the other cases the displacement is downwards. In no case have I noticed numbness or vesications from pressure upon the ulnar nerve. Of the four which are known to have broken into the joint, all are imperfect and all had anchylosis of the elbow-joint,

[1] "On a Particular Fracture of the Inner Condyle of the Humerus." By Benjamin Granger, Surgeon, Burton-upon-Trent. Op. cit., vol. xiv. pp. 196–201. April, 1818.

extending from three months to five years, or longer. In one case the condyle is displaced upwards, and in one, complicated with a dislocation, it is displaced downwards and forwards. In one other case, in which the fact is not known whether the fracture entered the joint or not, the condyle is displaced forwards. In no one of all the six cases of displacement of the internal condyle or of its apophysis is the displacement backwards, except in Case 45 of fracture of the apophysis.

B. Cooper, South, Sir Astley Cooper and others, speak of fractures of the internal condyle as very common, and more so than fractures of the external condyle, while Malgaigne has never seen a case of fracture of the inner condyle, and regards its occurrence as very rare. He has, however, seen occasionally fractures of the epitrochlea, an accident which one might well suppose would be not unfrequent, especially in children, since it is not completely united by bone to the condyle until about the seventh year, and it remains always quite prominent and exposed to injury, not to speak of its being sometimes broken, as Granger has suggested, by muscular action, in falls upon the hand.

Of eight fractures of the external condyle ("condyle and epicondyle" of Chaussier), seven occurred between the ages of four and twelve years, and one at the age of eighty-eight. In only two cases was the arm at the time of examination free from anchylosis (cases 62 and 63). In the first case no bony union had occurred, and I have suspected that the restoration of the arm to its complete functions was due, in some degree, to this mobility of the condyle; or perhaps it may have been only a fracture of the epicondyle, or of that portion of the condyle which lies without the capsule, in which case, either with or without bony union, the danger of anchylosis would be less than in fractures of the condyle communicating with the joint. But Malgaigne has never seen an example of this fracture, and notwithstanding considerable authority to the contrary, he doubts its possibility. In Case 63 the radius was also dislocated backwards and has never been replaced, but the functions of the arm are completely restored.

In two of the cases reported as anchylosed, I ought to remark, the arm was examined two months after the fracture, a period so near the time of the accident, that the final result could not be positively determined.

The fragment has almost always been found a little displaced; generally outwards or to the radial side, so as to increase the

breadth of the elbow-joint; in one instance the displacement is forwards, and in one a little backwards. Bransby Cooper and Chelius declare that the fragment is generally drawn upwards and backwards. I have seen nothing to confirm this statement, yet my observations are too few to authorize me to question its accuracy.

In Case 56, when the arm is extended, the forearm becomes strikingly deflected to the ulnar side, occupying an angle with the humerus of about 15°. When the arm is flexed, the line of the bone is completely restored.

In cases 57 and 59, the same phenomenon exists, except that the deflection is to the radial side.

Dorsey[1] speaks of this lateral inclination as being always to the ulnar side, but does not designate to what particular fracture of the elbow it belongs. He has also described a splint, contrived by Dr. Physick, intended to remedy the deformity in question. (Pl. III., Figs. 1 and 2.) Chelius also speaks of the same deformity as occurring after fractures of the *internal* condyle; but while I have not seen the forearm thrown either way after a fracture of the internal condyle, I have seen it, as will be observed, deflected to the *radial* side in two cases of fracture of the *external* condyle, and to the ulnar side in one case of fracture of the same condyle, and in one other case of fracture between the condyles.

I am unable to find any explanation of the fact stated by Chelius, that the forearm is sometimes deflected to the ulnar side after fracture of the inner condyle, unless the entire trochlea has been broken off and carried upwards; but the deflection to the radial side seems to be a natural consequence of the obliquity of the trochlea, when the support of the radius is lost, whether the portion of the humerus upon which it moves is displaced or not. The direction of this obliquity is such that the smooth surface of the trochlea presents strongly to the radial side; and even in the normal state, extension of the forearm inclines the hand to the radial side.

Of four fractures traversing the shaft and penetrating between the condyles ("fracture des deux condyles"), all are marked imperfect. In three anchylosis exists in some degree. As I have just mentioned, also, in Case 65, straightening the arm throws the forearm strongly to the ulnar side.

Malgaigne (pp. 558, 559) has spoken of a remarkable phenomenon which he has occasionally observed after fractures about the elbow-

[1] Elements of Surgery, Philada. ed., 1813, vol. i. p. 146.

joint, and of which he cites two examples, both of which he has illustrated by accurate drawings: "C'est une hypertrophie osseuse qui renfle au contraire certaines parties voisines, soit des fragments mêmes, soit des os contigus." In one example this hypertrophy occurred in both condylês, and in the upper ends of both radius and ulna. He has not yet observed this phenomenon in the bones of any other joint than the elbow-joint.

It is not improbable that the same expansion or hypertrophy occurred in Case 57 of fractures of the humerus; a case of fracture of the external condyle. The specimen of fracture of the neck of the radius, of which I have given a drawing, illustrates also this peculiar pathological condition.

In fractures of the humerus, I have preferred generally a broad and thick splint of gutta percha, sufficiently long to extend from the neck to the wrist, moulded accurately, and applied to the shoulder, arm, and forearm, while the limb is flexed to a right angle, and while extension is being made upon the humerus. This being properly padded, and secured in place by rollers, I place the arm in a sling, beside the body. The sling must, however, be so arranged, by being looped under the wrist, and not under the elbow, as that the weight of the elbow and lower part of the arm may aid in making extension. In Case 11, I attempted permanent extension with a gutta percha splint in the axilla. Other surgeons have sought to make permanent extension in certain fractures of the humerus, by various contrivances. Mr. Lonsdale had constructed an instrument which might be lengthened or shortened to suit the case; it was made of steel, and was worked with a screw operating upon cogs in a sliding bar; resembling, in some points, the humerus portion of Jarvis's adjuster. I think the same apparatus might easily be adapted to any form of arm splint.

In the second London edition of a series of Plates, illustrating the causes of displacement in fractures of the extremities, by S. W. Hind (p. 19), is a drawing of an apparatus constructed by the author for the same purpose, which is very simple, and in some respects more complete than Lonsdale's. Dr. Charles Winne, of this city, has also shown me one of Welch's angular splints, to which he has had adapted a movable crutch, and which, he informs me, he has employed twice, in such fractures of the humerus as seemed to demand permanent extension, with very satisfactory results.

I believe that all these contrivances may prove occasionally useful, but the common experience of surgeons has shown how difficult

it is to accomplish much extension by means of pressure in the axilla; a mode, too, which I think must be inadmissible when the fracture is near the upper end, since the pressure by the crutch head upon the pectoralis major and latissimus dorsi, which constitute the margins of the axilla, must tend to displace the fragments upon which they act inwardly; and which can seldom be applied with much force to fractures near the condyles, on account of the probable existence of inflammation and swelling about the joint.

Malgaigne, when speaking of the apparatus contrived by Lonsdale, remarks: "Que le chirurgien ne perde jamais de vue que l'extension permanente est une resource toujours dangereuse, souvent inutile, et qui exige dans son application beaucoup de réserve et de vigilance." (*Op. cit.*, tom. i. p. 541.)

Something may always be accomplished, when the patient is walking about, by allowing the elbow to escape from the sling, so that its weight shall make constant traction upon the lower fragment; and the plan which I shall hereafter suggest of treating certain cases of delayed union, namely: extending the arm at full length by the side of the body, so that the lower fragment shall receive the whole weight of the hand and forearm, might, perhaps, prove more efficient than either of the modes described.

The splints generally employed in this country, in fractures about the elbow-joint, are simple angular side splints, without joints, such as those recommended by Physick[1] (Pl. III., Fig. 1); angular pasteboard splints, felt, gutta percha, &c., or angular splints with a hinge, such as Kirkbride's[2] (Pl. III., Fig. 3), Thomas Hewson's,[3] Day's (Pl. III., Fig. 5), or Rose's (Pl. III., Fig. 4), or the more elegant and perfect angular splint of Welch (Pl. II., Fig. 2). For myself, I generally prefer gutta percha, moulded, and applied accurately to the limb; and this splint, or whatever other apparatus I employ, I take care to remove at a very early day—so early, indeed, as the seventh or eighth day, and to change the direction of its angle very frequently, giving each time to the elbow some passive motion. It is quite probable, however, that in a great majority of fractures of either the outer or inner condyle, the patient would suffer much less, and recover with quite as useful and perfect arms, if no splints whatever were employed. Nélaton and Mal-

[1] Elements of Surgery, by John Syng Dorsey, Philada. ed., vol. i. p. 145, 1813.

[2] Amer. Journ. Med. Sci., vol. xvi. p. 315.

[3] Note to Amer. ed. of Erichsen's Surgery, p. 211.

gaigne discourage their use in these fractures, since beyond the mere steadying of the elbow-joint, they can serve no practical purpose, and may, on the contrary, do considerable injury. Speaking of the fracture of the epitrochlea, Granger remarks: "This is the only instance of this accident out of five which I have seen, that the full range of flexion and extension of the forearm has not ultimately been obtained, or with so trifling an exception as not to be observable without close attention.

I have purposely avoided saying one word about replacing the detached condyle, and for these reasons: during the state of tumefaction which almost immediately follows this accident, no mechanical means could be successfully employed to retain these small fragments in place; and after it has subsided, it is usually too firmly fixed to allow it to be moved. Something may perhaps be accomplished by position and relaxation of the muscles, but I have found the effect of position also scarcely appreciable. In fact, I believe that, as a general rule, the less we interfere with the displaced fragments, the better for our patients, and for our own reputation.

The following remarks on a new mode of treatment in cases of delayed union of the humerus were made by myself to the "Buffalo Medical Association," and published in the *Buffalo Med. Journ.*, vol. x. p. 142; and, although I have not had any further opportunity to confirm the value of the suggestions there made, I still entertain a conviction that they will be found occasionally applicable.

"It has been observed by surgeons that non-union results more frequently after fractures of the shaft of the humerus than after fractures of the shaft of any other bone. This observation is confirmed by my own researches.

"Comparing the humerus with the femur, between which, above all others, the circumstances of form, situation, &c., are most nearly parallel, and in both of which non-union is said to be relatively frequent, I find that of forty-nine fractures of the humerus, four occurred through the surgical neck, twelve through the condyles, and twenty-nine through the shaft. In one of the twenty-nine, the patient survived the accident only a few days. In four of the remaining twenty-eight, union had not occurred after the lapse of six months, and in many more was it delayed considerably beyond the usual time. Two of the four were simple fractures, and occurred near the middle of the humerus; the third was compound, and occurred near the middle also; the fourth was compound, and occurred near the condyles.

"This analysis supplies us, therefore, with four cases of non-union, from a table of twenty-eight cases of fractures through the shaft.

"Of eighty-seven fractures of the femur, twenty occurred through the neck, one through the trochanter major, and one through the condyles. The remaining sixty-five occurred through the shaft and generally near the middle, and in not one case was the union delayed beyond six months.

"To make the comparison more complete, I must add that of the twenty-eight fractures of the shaft of the humerus, six were compound; and of the sixty-five fractures of the shaft of the femur, six were either compound, comminuted, or both compound and comminuted. The six compound fractures of the shaft of the humerus furnished two cases of non-union. The six cases of either compound or comminuted, or compound and comminuted fractures of the femur, furnished no case of non-union.

"I beg to suggest to the Society what seems to me to be the true explanation of these facts.

"It is the universal practice, so far as I know, in dressing fractures of the humerus, to place the forearm at right angles with the arm. Within a few days, and generally, I think, within a few hours, after the arm and forearm are placed in this position, a rigidity of the muscles and other structures has ensued, and to such a degree that, if the splints and sling are completely removed, the elbow will remain flexed and firm; nor will it be easy to straighten it. A temporary false anchylosis has occurred, and, instead of motion at the elbow-joint, when the forearm is attempted to be straightened upon the arm, there is only motion at the seat of fracture. It will thus happen that every upward and downward movement of the forearm will inflict motion upon the fracture; and, inasmuch as the elbow has become the pivot, the motion at the upper end of the lower fragment will be the greater in proportion to the distance of the fracture from the elbow-joint.

"No doubt it is intended that the dressings shall prevent all motion of the forearm upon the arm; but I fear that they cannot always be made to do this. I believe it is never done when the dressing is made without angular splints; nor is it by any means certain that it will be accomplished when such splints are used. The weight of the forearm is such when placed at right angles with the arm, and encumbered with splints and bandages, that even when supported by a sling, it settles heavily forwards, and compels the arm dressings to loosen themselves from the arm in front of the

point of fracture, and to indent themselves in the skin and flesh behind. By these means, the upper end of the lower fragment is tilted forward. If the forearm should continue to drag upon the sling, nothing but a permanent forward displacement would probably result. The bones might unite, yet with a deformity.

"But the weight of the forearm under these circumstances is not uniform; nor do I see how it can be made so. It is to the sling that we must trust mainly to accomplish this important indication. But you have all noticed that the tension or relaxation of the sling depends upon the attitude of the body, whether standing or sitting —upon the erection or inclination of the head, body, or upper extremities. It is probable, gentlemen, that you have made the same observation.

"From this, and many similar facts, I have been led to suspect, for a long time, that motion has had less to do with non-union than was generally believed.

"I find, however, no difficulty in reconciling this suspicion with my doctrine in reference to the case in question; and it is precisely because, as I have already explained, the motion, in case of a fractured humerus, dressed in the usual manner, is peculiar. In a fracture of the clavicle through its middle third (its usual situation), the motion is upon the point of fracture, as upon a pivot; although, therefore, the motion is almost incessant, it does not essentially, if at all, disturb the adhesive process. The same is true in nearly all other fractures. The fragments move only upon themselves, and not to and from each other. I know of no complete exception but in the case now under consideration.

"Aside of any speculation, the facts are easily verified by a personal examination of the patients during the first or second week of treatment, or at any time before union has occurred, both in fractures of the humerus and clavicle. The latter is always sufficiently exposed to permit you to see what occurs, and as soon as the swelling has a little subsided in the former case, you will have no difficulty in feeling the motion outside of the dressings, or perhaps in introducing the finger under the dressings sufficiently far to reach the point of fracture. I believe you will not fail to recognize the differences in the motion between the two cases.

"Such, gentlemen, is the explanation which I wish to offer for the relative frequency of this very serious accident—non-union of the humerus.

"I know of no other circumstance or condition in which this bone

is peculiar, and which, therefore, might be invoked as an explanation. Overlapping of the bones, the reason assigned by some writers, is not sufficient, since it is not peculiar. The same occurs much oftener, and to a much greater extent, in fractures of the femur, and equally as often in fractures of the clavicle; yet in neither case are these results so frequent. Nor can it be due to the action of the deltoid or of any other particular muscles about the arm, whether the fracture be below or above their insertions, since similar muscles, with similar attachments on the femur and on the clavicle, tending always powerfully to the separation of the fragments, occasion only deformity, but not non-union.

"If I am correct in my views, we shall be able sometimes to consummate union of a fractured humerus where it is delayed, by straightening the forearm upon the arm, and confining them to this position. A straight splint, extending from the top of the shoulder to the hand, made of some firm but moulding material, and made fast with rollers, will secure the requisite immobility to the fracture. The weight of the forearm and hand will only tend to keep the fragments in place, and if the splint and bandages are sufficiently tight, the motion occasioned by swinging the hand and forearm will be conveyed almost entirely to the shoulder-joint. Very little motion, indeed, can in this posture be communicated to the fragments, and what little is thus communicated, is a motion which experience has elsewhere shown is not disturbing or pernicious, but a motion only upon the ends of the fragments as upon a pivot.

"I do not fail to notice that this position has serious objections, and that it is liable to inconveniences which must always, probably, prevent its being adopted as the usual plan of treatment for fractured arms. It is more inconvenient to get up and lie down, or even to sit down, in this position of the arm; and the hand is liable to swell. But I shall not be surprised to learn that experience will prove these objections to have less weight than we are now disposed to give them. Remember, the practice is yet untried—if I except the case which I am about to relate, and in which case, I am frank to say, these objections scarcely existed. The swelling of the hand was trivial, and only continued through the first fortnight, and the patient never spoke of the inconvenience of getting up or sitting down, or even of lying down." (See Case 22.)

CHAPTER VIII.

RADIUS.

Upper Third.

Neck.

CASE 1. *Supposed fracture. Reduction and subsequent displacement. Result imperfect.*

Elizabeth Fowler, of Phelps, N. Y., æt. 11, fell from a tree and fractured her right arm. Dr. Bannister, who regarded it as a fracture of the neck of the radius, reduced the fragments, and applied two splints, with compresses, rollers, &c., and placed the forearm at a right angle with the arm. At the end of two weeks, the dressings were removed. She could then flex and extend the arm very well. The forearm was again dressed, but only one splint was employed. Twenty-eight days from the time of the accident, all dressings were finally removed; and, at this time, no projection at the seat of fracture was noticed. The hand was, however, proned. From this day, the forearm was gradually straightened upon the arm for several days. It was then again flexed partially, but after this it could not be again made straight. (Such is the statement made by the father.)

I examined the arm fifteen months after the accident, and found only slight power of flexion and extension; but this power was steadily improving. The hand was forcibly proned, and could not be supined. A projection existed in front of the elbow at the supposed seat of fracture, which might have been the head of the radius, a callus over the seat of fracture, or the fragments displaced forwards. I think it was the latter; and, if so, it was probably produced by straightening the arm on the fourth week, when the biceps was contracted, and whilst the bond of union between the fragments was not firm.

CASE 2. *Supposed fracture, probably complicated with fracture of the external condyle. Union with deformity.*

Gilbert Sole, of Darien, Genesee Co., N. Y., æt. 8, fell, while

sliding down a hill, in Dec., 1854. No surgeon was employed until five weeks after the accident, when he was seen by J. C. Holt, of Bennington, Wyoming Co., N. Y.

Ten weeks after he received the injury, his parents brought him to me. The left arm was then anchylosed at right angles. The fractured ends of the radius seemed to be displaced forwards, and, as I believed, could be very distinctly felt. The hand was proned, and could not be supined. I think the external condyle was broken also, and slightly displaced.

CASE 3. *Supposed fracture, complicated with dislocation of the upper end of the ulna. Deformity and maiming.*

John R. Amsdel, of White's Corner, æt. 25. It was treated by Dr. Nott, of Buffalo.

I examined the arm six months after the accident. The upper end of the lower fragment appeared to be displaced forwards. Very little motion at the elbow-joint, and both pronation and supination are lost.

Middle Third.

CASE 4. *Simple fracture. Union without deformity.*

David Shortwell, of Saratoga Co., æt. 21, broke the radius near its middle. It was treated by a surgeon at Saratoga.

Fifty years after the accident, the arm was in every respect perfect, except that the power of pronation and supination was restricted.

CASE 5. *Simple fracture. Union with deformity.*

Wm. Lynn, of Buffalo, æt. 35, broke the radius, July 22d, 1850, near the lower end of the middle third.

I dressed the arm carefully with two broad splints, on the same day on which it was broken. Five days after, I opened the dressings and found the fragments in place; the same observation was made on the twenty-first day. At this time, I removed the dorsal splint, and continued only the palmar, thinking that the union was sufficiently firm to warrant this procedure.

One week later, I found the splints somewhat loose, and the fragments projecting forwards. I requested him to permit me to straighten it by force, but he declined. I then applied a compress over and near one end of the salient fragments, and secured it in place with a splint and roller. At the next dressing, seven days

later, I could not feel the projection; but a few days later it was very manifest.

Twenty-two weeks from the date of the fracture, Lynn had his arm nearly torn off in a railroad accident, and I amputated it near the shoulder-joint.

On examining the radius, I found the projection was due to a forward displacement of the fragments, and not to a callus. (See specimen in my collection.)

My impression is that the fragments were never completely replaced, or, if they were, that they soon became displaced. Yet I was very careful and diligent to accomplish a complete reduction, and to retain them in position; and, if the displacement existed prior to the twenty-first day, it was overlooked because the effusion of lymph and serum among the tissues rendered it impossible to recognize it. I say this, because I am unwilling to admit any degree of carelessness or lack of attention on my part. Almost every day I had examined the limb, and as often as every fourth or fifth day I had removed and renewed the dressings.

The probability is, nevertheless, that it did exist, and that only when the swelling subsided it became manifest. It is not only the superficial swelling which has thus frequently deceived me, and induced me to think a limb was straight when it was not, but it is especially that deeper and more firm effusion in the immediate neighborhood of the fracture, and which often remains long after the superficial tumefaction has subsided.

Lower Third (above line of Colles' Fracture).

CASE 6. *Simple fracture. Result perfect.*

E. J. Schoonmaker, of Seneca County, N. Y., æt. 16, fell from a carriage, striking upon the back of his hand, and breaking the radius obliquely, about three inches from its lower end. The lower end of the ulna was also slightly displaced. A surgeon reduced the fracture within eleven hours after the accident, and applied splints, &c.

Six years after this I examined the arm. The seat of fracture could be plainly felt, but the fragments were perfectly in place. The arm is as perfect as before.

CASE 7. *Simple fracture. Result perfect.*

Lyman J. Barrows, of Utica, æt. 12, was struck by the fore foot

of a horse, breaking his left arm, and producing in the fall a dislocation of the left tibia, with a fracture of the corresponding fibula. The radius was broken four inches above the wrist. Dr. Ford, of Cazenovia, dressed the arm with an anterior and posterior splint.

Ten years after, when Mr. B. was under my instructions as a student of medicine, the radius was slightly bent towards the ulna at the seat of fracture. In other respects it was perfect, and the arm was as useful as the other.

CASE 8. *Simple fracture. Result perfect.*

Elisha Standish, of Livingston Co., æt. 39, broke his radius through the lower third.

It was dressed by a surgeon in Livingston Co., and eight years after I could find no traces of the accident.

CASE 9. *Simple fracture. Result perfect.*

Preston Brooks, æt. 15, broke the radius four inches above the wrist. Dr. Wallis, of Aurora, dressed the arm.

Three months after, the seat of fracture could not be discovered.

CASE 10. *Simple fracture. Union with slight displacement.*

Geo. Vogel, æt. 30, admitted to Buffalo Hospital Nov. 2, 1852, with a fracture at the upper end of the lower third of the right radius. The lower end of the ulna displaced to the ulnar side.

I reduced the fracture as well as I was able to do, and applied a gutta percha splint, and secured it with a paste bandage. I was unable, at the time, to prevent the broken ends from falling against the ulna.

The dressings were finally removed on the first of December. No mention is made of the condition of the fragments at this time, but I presume they were in the same position as when I dressed the arm at first.

Lower Third.

Near union of Epiphysis with Diaphysis (Colles' Fracture).

CASE 11. *Simple fracture. Result perfect.*

Thomas Burton, of Buffalo, æt. 22, fell, March 2, 1851, fifteen feet into the hold of a vessel. I was called about nine hours after the accident occurred. The left wrist was much swollen, and the

radius broken about one inch and a half above the joint. The lower fragment was displaced forwards.

I reduced the fragments and applied two broad, well-padded straight splints.

Three months after the bones were united without displacement, but the wrist remained stiff.

CASE 12. *Simple fracture. Result perfect.*

Harvey Hibbard, æt. 14, broke the radius about one inch above the wrist. Dr. Henry Moore, of Manlius, N. Y., dressed the fracture.

Twenty-four years after the accident I find no traces of it.

CASE 13. *Simple fracture. Result perfect.*

Stephen Goodwin, Esq., of Auburn, æt. 15, broke his left radius just above the wrist.

It was treated by his father, who was a surgeon of great respectability, in Ontario Co., N. Y.

Twenty-five years after, I could find no traces of the accident.

CASE 14. *Simple fracture. Result perfect.*

Mrs. John Little, of Buffalo, æt. 43, fell, Feb. 9, 1852, and broke the radius about one inch from its lower end. The ulna was prominent below, and the hand fell backwards and to the radial side.

Dr. John Trowbridge was first called, but on the following day, at his request, I took charge of it. I reduced the fracture, and applied two straight, broad, firm, and well-padded gutta percha splints.

The result, after three months, was a perfect limb.

CASE 15. *Simple fracture. Result perfect.*

Mrs. Ellen Boyle, of Buffalo, æt. 38, fell, March 20th, 1856, with her left arm under her back and side, breaking the radius about three-quarters of an inch above the joint.

I was immediately called, and found the lower fragment carried back, the lower end of the ulna projecting in front. The wrist was already considerably swollen. I could not detect crepitus. By extension and pressure I reduced the fragments and applied a well-padded palmar splint, carved and shaped to the arm and hand. The next day I loosened the dressings.

March 27. At my request Dr. Ellory P. Smith took charge of

the case, and after we had carefully examined the arm and found the fragments still apparently in place, Dr. Smith applied his curved splint constructed with a movable joint.

April 30, 1856. Dr. Smith has just removed the splint. Arm is perfect, save that a stiffness of the wrist-joint still remains.

CASE 16. *Simple fracture, without displacement. Union without deformity or maiming.*

John Ford, of Buffalo, æt. 40, January 27, 1854. A block of ice fell upon his right arm, breaking the radius near its lower end. He came to me on the same day. Motion and crepitus were distinct, but there was no discoverable displacement of the fragments.

I applied a curved splint to the palmar surface of the forearm and hand, which would incline the hand to the ulnar side.

Five weeks and one day from the date of the accident, I removed all dressings. The bone had united without deformity or maiming. No ensheathing callus could be felt around the seat of fracture.

CASE 17. *Simple fracture. Result perfect.*

A. Ellis, of Buffalo, aged about 35 years, fell, August 23, 1855, striking upon the palm of his left hand, and breaking the radius about one inch above the wrist-joint.

Ellis came immediately to me. The fracture was nearly transverse. The lower end of the upper fragment was quite prominent in front, the lower fragment and the carpus being carried back and a little outwards.

I reduced the bones easily by extension and pressure, and they showed no tendency to become again displaced. I applied a broad, straight, and well padded splint to the palmar surface of the forearm and hand.

On the 19th day, I found the fragments firm; but there was no ensheathing callus which could be felt, nor was there any detected subsequently. On this day I removed all splints and other dressings, only enjoining upon the patient great care in the handling of the limb.

Six weeks from the date of the accident, the wrist and hand were still somewhat swollen, and the joints stiff, but the fragments seemed in perfect line, and the hand not at all deformed.

CASE 18. *Simple fracture. Result perfect.*

Hugh O'Brien, of Buffalo, æt. 37, fell from a wagon, October 27,

1853. Arm dressed by Dr. Mixer. Admitted to the hospital on the 28th, and examined before the class on the 29th.

I found the radius broken nearly transversely about one inch above the articulation. Fragments very nearly in perfect position. I dressed the arm with two broad, straight, and well padded splints.

On the fourth day I removed one of the splints, and continued only the palmar.

November 10, he left the hospital, but returned on the 14th (eighteenth day). The fragments were now united, and no deformity remained.

CASE 19. *Simple fracture. United without deformity.*

Margaret Read, æt. 60, fell, September 23, 1855, striking on the palm of the right hand, breaking the radius about one inch from the lower end of the bone. I found her in the hospital, at the commencement of my service, October 1, 1855, one week after the accident. Dr. Ellory P. Smith, hospital surgeon, had reduced the fracture, and dressed the arm. The arm was dressed with two of Day's splints, one on the palmar and one on the dorsal surface; which were well padded, and neatly applied. Dr. Smith had not yet examined the fracture since it was dressed by himself, and he requested me to open it. We found the fragments displaced, so that the hand fell backwards and to the radial side, and the ulna was prominent below.

I immediately proceeded to make extension, at the same time that I pressed the lower fragment forcibly forwards; I succeeded, I think, in reducing the fragments. I then applied straight splints, well padded, instead of Day's splint.

On the 3d of October I loosened the dressings, which were quite snug, and found the fragments again out of place. Using still more force, and having again as I believe reduced the fragments, I dressed the arm as I had dressed it before.

October 18. The fragments had united, and without displacement. From this time only one splint was used, and on the 30th, the other splint was removed also.

She left the hospital November 4, with her hand and wrist slightly swollen, and with considerable stiffness at the wrist and elbow joints.

CASE 20. *Simple fracture. Union with slight deformity.*

H. W. B., of Buffalo, æt. 17, fell in a gymnasium, striking upon the palms of both hands. He was seen soon after by Dr. G., who

believed he had sprained both wrists, and did not apply splints. The next day he came under the charge of Dr. White, of Buffalo.

April 26, 1853. Dr. White brought him to my office. The fragments were then united. The ulna projected to the ulnar side, and the hand was inclined to the radial side.

September 10. No change in the form of the arm. Its motions are, however, perfect.

CASE 21. *Simple fracture. Union with deformity.*

Mrs. Margaret Doyle, æt. 25, fell, December, 1850, on the ice. She fell with her left hand a little back of her, but struck on the palm. A surgeon in Pittsford, Vt., dressed the fracture. He applied four narrow splints. Dressing continued eight weeks.

I examined the arm April 1, 1856. The lower fragment is displaced backwards, and a little supined, and the hand falls to the radial side. The lower end of the ulna projects in front. Pronation and supination are nearly perfect, but flexion at the wrist-joint is imperfect. Her arm is very weak, and occasionally painful.

CASE 22. *Simple fracture. Union with slight deformity.*

Mrs. Abner Birmingham, of Buffalo, æt. 25, was thrown from a load of wood, August 12, 1853, breaking her right radius near the wrist. The right leg was also severely injured, and was immediately amputated.

I applied to the palmar surface of the forearm a broad gutta percha splint, and inclined the whole hand to the ulnar side. Two months later, the hand was found to be inclined to the radial side, and the styloid process of the ulna was prominent. The wrist was also swollen in front, and above the annular ligament, the finger and wrist-joints were quite stiff, and she had no power of pronation or supination.

One year later, all the functions of the hand were restored, but the inward inclination of the hand remains.

CASE 23. *Simple fracture. Union with slight deformity.*

Henry Sherry, of Buffalo, æt. 45, broke the radius of the left arm by a fall upon the open palm, Feb. 2, 1854. The fracture was near the wrist.

Dr. Hackstein was called, and attempted reduction by powerful extension and counter-extension. He applied a palmar and dorsal splint. Treatment continued five weeks.

Eighteen weeks after, Sherry called upon me, complaining of his surgeon. The hand was inclined slightly to the radial side, and the ulna was projecting to the ulnar side. The wrist-joint remained rather stiff.

CASE 24. *Simple fracture. Union with deformity and maiming.*

Charles Stratton, of Buffalo, a healthy and temperate laborer, æt. 36, fell forwards from a wagon, striking upon the palm of his left hand. The accident occurred Nov. 22, 1854.

Stratton came immediately to my office, and I found the radius was broken a little more than one inch above the wrist-joint. I reduced the fracture, and applied a well-padded curved dorsal splint to the forearm and hand. I renewed the dressings on the 24th and 27th; and on the 29th, when I called, I found the arm much swollen. I could not ascribe this accident to the tightness of the dressings, nor to any act on the part of the patient. Its character was decidedly erysipelatous. I removed at once all of the dressings, and, laying the arm upon a broad board, covered with a cushion and a silk oil-cloth, I directed it to be kept wet with cold water. In a few days, the swelling subsided, and, finding that the patient was very careful with the arm, and that no displacement of the fragments had occurred, the splints and bandages were not re-applied. At the end of five weeks all dressings were discontinued. There was no ensheathing callus at this date, but the union was firm.

June 1, 1855. Six months after the accident, I found the arm perfectly straight, so that it was not possible to detect the place of fracture. The wrist-joint still remained quite stiff, and also the fingers, so that he was unable to flex them but moderately. There was no swelling or soreness, but he was unable to use his hands for purposes of labor.

One year from the accident he was still unable to work, but the hand was slowly improving.

CASE 25. *Simple fracture. Union with deformity.*

Mary Kelly, of Buffalo, æt. 60, fell, March 18, 1855, upon the sidewalk, breaking the left radius half an inch above the lower end. It was treated by Dr. Wm. Ring, of Buffalo, with Day's curved splint.

Mary called upon me, April 28, six weeks after the accident. The splint had then been removed two weeks. The arm was

slightly swollen, and the wrist and finger-joints were stiff. The lower end of the ulna was prominent. The lower fragment, with the carpus, was inclined backwards, and the hand fell to the radial side.

CASE 26. *Simple fracture. Result nearly perfect.*

Mrs. H., of Chicago, Ill., æt. 56, fell, striking on her left hand, in 1853, breaking the radius about one inch above the joint. Dr. McVicker, of Chicago, dressed and treated the fracture. He applied pasteboard splints, and continued them six weeks.

I examined the arm two years after the injury was received, and found the hand inclined to the radial side, and the ulna prominent. The motions of the wrist-joint are now completely restored; but she can only partially flex her fingers.

CASE 27. *Simple fracture. Union with deformity.*

Joseph Brinstead, of Germany, æt. 10, broke the radius of the left arm near the wrist-joint. It was dressed and treated by a surgeon in Germany. Twelve years after the arm was broken he came under my care at the Buffalo Hospital, and I found the forearm shortened an inch, with the ulna displaced downwards towards the hand.

CASE 28. *Simple fracture. Result imperfect.*

Edson Knapp, of East Hamburg, N. Y., æt. 67, was thrown, Dec. 24, 1855, by a young steer, breaking the radius of the left arm one inch above the wrist. I saw Mr. Knapp twelve hours after the accident. Wrist much swollen and very painful. Hand and lower fragments carried backwards and to the radial side. With moderate force, I brought the fragments into form. Not much tendency to displacement. I applied a curved splint to the palmar side of forearm and hand, to which was subsequently added a dorsal splint.

The bones united in about the usual time, and with very little deformity.

CASE 29. *Simple fracture. Union with slight deformity, &c.*

Mrs. S. Hooper, of Black Rock, æt. 51, broke the right radius near the wrist in the spring of 1852. Dr. Dayton was employed.

About one year after the accident, Mrs. H. called upon me. I found the lower fragment slightly bent backwards at the seat of fracture, and the wrist-joint remaining quite stiff. The lower end of the ulna projects slightly to the ulnar side.

She complained of her surgeon; but I soon persuaded her that other surgeons, for whom she professed to have a great respect, were quite as unsuccessful in many cases.

CASE 30. *Simple fracture. Union with deformity, &c.*

Mrs. A. N. Larreau, of Buffalo, æt. 26, fell upon the palm of her left hand, and broke the radius near the lower end. Dr. Barnes, of Buffalo, was employed.

I examined the arm about four years after the accident, and found the hand inclined to the radial side, and the ulna projecting to the ulnar side. She complains that her surgeon did not "set" it right.

CASE 31. *Simple fracture. Union with slight deformity.*

Lucinda Adgel, æt. 48, broke her left arm Dec. 14, 1855, by falling and striking on the palm of her hand.

It was dressed immediately by Dr. James P. White, with two straight splints, and sent to the hospital.

Dec. 20. I removed and reapplied the dressings, substituting padded splints for those which were first applied.

Jan. 15. The fragments were united, and all splints and bandages were removed, except during the night.

21*st.* She left the hospital. There remained, I think, a slight bend at the seat of fracture, the hand falling a little to the radial side, and the lower end of the ulna projecting slightly. The wrist also was stiff, and the hand swollen.

CASE 32. *Simple fracture. Union with very slight deformity.*

Mrs. Ann Hunt, æt. 43, fell, Jan. 4, 1856, striking on the palm of her left hand, breaking the radius about one inch above the wrist-joint. Dr. E. P. Gray, of Buffalo, dressed the arm immediately, and sent her to the hospital.

I found the forearm covered with a roller, and supported by two of Day's carved splints—what Mr. Day calls a radial splint—being placed along the back of the forearm, by which the hand was thrown to the ulnar side, and a short carved splint in front, each padded with loose pieces of cotton batting.

On the following day, finding the dressing very painful, I substituted straight, broad, well-covered, and carefully padded splints. I did not again apply the roller to the forearm, underneath the splints.

Jan. 12 (eighth day). I found the fragments were not in place, and, as the swelling was then much reduced, I resorted to considerable force to restore them to position; and, having succeeded, I applied curved splints to both palmar and dorsal surfaces, each of them being very heavily and carefully padded.

30*th.* The bandages were removed, and tapes substituted. Bones firmly united, and, I think, in place. Splints to be removed during the day, &c. &c.

April 1. She has been at work eight weeks. Bones united without deformity. Lower end of ulna projects laterally, but not in front. Pronation and supination perfect. Flexion of wrist-joint and of finger-joints not completely restored.

CASE 33. *Simple fracture. Union with deformity and maiming.*

Hannah Davis, æt. 52, broke the radius very near its lower end. It was dressed by a surgeon in Pennsylvania.

Three years after the accident, I saw her. She was residing in Bath, Steuben County, N. Y. Her hand was bent backwards and to the radial side. The lower end of the ulna was very prominent.

The fingers were contracted, and the whole hand weak. I have not recorded, nor do I remember the treatment that was adopted.

CASE 34. *Simple fracture. Union with deformity.*

Morton Williams, of Buffalo, æt. 8, fell, in July, 1851, and broke the radius at the junction of the epiphysis with the shaft. Dr. Aldrich, a very intelligent young surgeon in a neighboring town, had charge of the arm. After the lapse of several days, the lad was brought home and placed under my care. I found the dressings neatly and judiciously applied, but on removing them I discovered the hand was inclined to the radial side, leaving the ulna projecting below. The lower fragment and the wrist were carried slightly backwards, and the lower end of the upper fragment forwards. I attempted to restore the fragments to position, but I found the union too firm. I then applied splints with compresses, firmly, and after a few days I found a slight improvement, but some deformity has remained. The motions of the wrist are perfect.

CASE 35. *Simple fracture. Union with deformity. Prosecution.*

Mrs. Raymond, of Albion, N. Y., æt. 29, was turned over in a stage-coach and broke the radius just above the wrist-joint. Dr.

Huff, a surgeon of well-known skill, residing in Albion, was called and treated the fracture.

About three months after, Mrs. Raymond called upon me to ascertain whether the arm could be improved, and whether I believed the treatment had been correct.

The hand falls slightly to the radial side, and the lower end of the ulna is prominent. The motions of the wrist-joint are not free.

She subsequently commenced an action against the doctor for damages, but I am not aware that it was ever brought to trial.

CASE 36. *Simple fracture. Union with deformity.*

Mrs. J. D. Bates, of Attica, æt. 56, broke her right radius just above the wrist, in November, 1851. Dr. Boyce, of Attica, dressed the fracture.

The arm was dressed with two straight splints with pads laid underneath, both on the palmar and dorsal surface of the wrist. Vesications occurred under the compresses. The splints were worn more than ten weeks.

Nearly four months after the accident, Mrs. B. called upon me. The hand then fell to the radial side, and the lower end of the ulna was prominent to the ulnar side. The hand was still swollen, stiff, and very weak.

March 31, 1856. The hand has not improved much. She cannot bend the wrist-joint, nor can she supine the forearm. The fingers can be partially flexed, but not sufficiently to grasp anything; indeed, the whole arm is nearly powerless. She suffers almost constantly some pain in the wrist and hand.

Simple fracture (not treated by a regular surgeon). Union with deformity. (See Case 4, Fractures of Ulna.)

Samuel Duckett, æt. 14, broke his left radius just above the wrist. It was examined by an empiric (a German doctor), who said it was not broken, and adopted no treatment.

Four weeks after the accident, he came to the hospital, with a fracture of the olecranon process of the ulna, which had occurred two days before.

The fragments of the radius are firmly united. The hand falls to the radial side; the lower end of the ulna projecting remarkably. The power of supination and pronation is lost. The hand is forcibly proned.

Fractures commencing on the Radial Side of the Bone, and terminating in the Joint.

CASE 37. *Simple fracture. Result perfect.*

William Henry Valentine, of Buffalo, æt. 13, fell, Nov. 10, 1855, from a tree, about twelve feet, striking upon the right hand and wrist.

The bone was broken very obliquely from the radial side downwards towards the ulnar side, and I think it entered the joint without entirely traversing the shaft of the bone.

The hand fell to the radial side, and the lower fragment was displaced backwards.

William was admitted to the hospital on the following day, at which time I reduced the fracture, and dressed the arm with a straight wooden splint on the palmar aspect, and a piece of binders' board on the dorsal, both well covered and padded. I applied, also, two extra pads, one over the lower fragment on the back of the wrist, and one over the upper fragment in front and near the middle of the arm.

On the 7th day, I readjusted the dressings, and found the dorsal pad had occasioned a slight vesication.

I examined the arm, April 22, 1856, five months after the accident. The bones have united without deformity or maiming.

CASE 38. *Simple fracture. Union without deformity.*

George Mallory, æt. 38, fell, February 4th, 1856, striking on the palm of his left hand. It was dressed by Dr. Lay, of Buffalo, with Day's curved splints, well padded and neatly applied; one upon the dorsal, and one upon the palmar surface. He was admitted, on the same day, to the Buffalo hospital.

Feb. 7. Dr. Lemon, the house surgeon, finding these dressings becoming painful, removed them, and applied two broad, straight, and carefully-padded splints.

This dressing was continued by myself, and by Dr. John Boardman, the hospital surgeon who succeeded me.

March 27. The splints have been for some time removed. The wrist remains swollen and stiff. The lower end of the ulna is prominent, but the fragments of the radius seem to be in exact line.

Cabinet Specimen of Separation and supposed Fracture of the Neck of the Radius. (See Pl. I. Fig. 2.)

This interesting specimen belongs to Dr. Robert Watts, of New York, by whom it has been kindly sent to me for examination. It was found in the dissecting room, and beyond this its history is not known. It is the same specimen to which Dr. Parker has referred in a note to S. Cooper's Surgery, fourth Am. ed., vol. ii. p. 334.

The bones appear to belong to an adult, the union of the epiphyses being complete, but the size would indicate that the person was rather below medium stature. The bones are dried and varnished; the interosseous ligament, and portions of the ligaments surrounding the head of the radius being the only soft parts remaining.

The radius is separated, transversely, four lines above the tubercle. The lower fragment is in no manner displaced, being neither drawn forwards, nor rotated outwards. Its broken extremity resembles somewhat a recent fracture, the bony cells, so near as I can judge in a varnished specimen, being quite open. Nor is there any appearance of callus around either fragment, unless it be in the presence of a very small deposit on the front of the lower fragment near the margin of the fracture, between which and the tubercle there exists an abrupt, irregular depression. It is most probable that the appearance of bony deposit is rather due to the removal of the bone below, which has produced a relative, but not absolute elevation above.

The upper fragment is displaced in such a manner as that its upper surface, which articulated with the humerus, is directed forwards. A crescentic piece, however, has been removed from the anterior half of the head, which allows it to rest like a cap upon the upper end of the lower fragment.

The two fragments are held together by a dried tissue, situated around and outside but not between the fragments, and which does not seem to have been disturbed except in front, where it is entirely removed.

The lesser sigmoid cavity, in which the head of the radius originally moved, is narrowed in its vertical diameter, as if its lower margin had been pressed upwards, and there is a small fossa just below, against which the head of the radius now rests.

The upper cap-like extremity, or articulating surface of the radius, is slightly irregular, as if portions of the synovial membrane

had been removed by ulceration. The same appearances are presented over the whole of the greater sigmoid cavity of the ulna.

While, as I have mentioned, both bones are in their general dimensions below the medium size for adults, their upper extremities are above the medium size, at least in their transverse diameters. Thus, comparing this radius with the sound radius of an adult before me, the sound radius measures around the bicipital protuberance two inches and three lines, and the broken radius measures at the same point one inch and eleven lines; while the sound radius measures across its head, in its longest diameter, eleven lines, and the broken radius, in the same diameter, twelve lines. The same disparity exists between the upper end and the shaft of the ulna.

My conclusion is, that this was not a fracture the result of any external or sudden violence, occurring in a bone previously sound; but that it was a case of ulcerative disease of the elbow-joint, accompanied with inflammation and consequent hypertrophy of the bones, and also with caries, and resulting finally in a fracture or disruption of the bone through the neck.

Cabinet Specimen of Fracture of the Neck of the Radius. Collection of Dr. T. D. Mütter, Philadelphia.

The history of this fracture is unknown. The line of fracture seems to have passed through the neck of the left radius, just at the upper extremity of the bicipital protuberance. Union with deformity has resulted. Owing to the fracture having taken place within the insertion of the biceps, that muscle appears to have drawn forward and upward the lower end of the short upper fragment. In consequence of this movement, the articulating facet on the head of the radius is tilted backwards, so as no longer to be in contact with the humerus. As a secondary consequence, the anterior edge of the head of the radius rests permanently against the articulating surface of the humerus. At this new point of contact a new surface of articulation is seen to have been formed, while the original articulating facet is directed backwards, and lies at right angles to the one of more recent formation. At the inner edge of the new articulation of the head of the radius with the humerus, contact with the ulna has developed another surface of articulation. The upper and lower fragments are, as seen in the

illustration, united at an angle, and the radius does not appear to have lost in length. (See Plate I. Fig. 3.)

Cabinet Specimens of Fractures commencing on the Radial Side of the Bone, and terminating in the Joint.

Specimen 1. Dried. Adult. Oblique fracture extending into joint. Complicated with a fracture of the styloid process of the ulna. Found in the dissecting-room, united by bone. (Pl. I. Figs. 4 and 5, palmar and dorsal surfaces of the same specimen.) (Henry H. Smith, Philadelphia.)

Specimen 2. Dried and scraped. Adult. United by bone. "It appears as if the styloid process and something more may have been broken off, not obliquely, but straight down into the joint. It is an old fracture, and strongly united. The fragment stands off and outwards from the bone, but it cannot be said that there is much displacement. There is also some appearance as if the fracture may have extended transversely or nearly so across the bone, about half an inch above the articular surface; but this appearance is only seen in front." Jackson. (H. J. Bigelow, Boston, Mass.)

Specimen 3. Dried. Adult. Broken almost perpendicularly into the joint. Not united. Fragment lost. History unknown. (Charles Gibson, Richmond, Va.)

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
UPPER THIRD (NECK).											
1	11 y.	1 y.	F.	R.	Simple	Forearm bent at right angles until 28th day, then straightened out.	U.			Slight anchylosis, and forced pronation of hand.	Imp.
2	8 y.	10 w.	M.	L.	Complicated with fracture of condyle	Did not employ a surgeon until after five weeks.	U.			Anchylosis; hand pronated.	Imp.
3	25 y.	6 m.	M.		Complicated with dislocation of ulna		U.			Anchylosis, and loss of both pronation and supination.	Imp.
MIDDLE THIRD.											
4	21 y.	50 y.	M.		Simple		U.			Perfect in every respect, except that pronation and supination were a little restricted.	P.
5	38 y.	6 m.	M.		Simple	Palmar and dorsal splints.	U.			Slight forward bend of fragments.	Imp.
LOWER THIRD (ABOVE POINT OF COLLES' FRACTURE).											
6	16 y.	6 y.	M.		Simple		U.				P.
7	12 y.	10 y.	M.	L.	Simple		U.			Fragments bent slightly towards ulna.	P.
8	39 y.	8 y.	M.		Simple		U.				P.
9	15 y.	3 m.	M.		Simple		U.				P.
10	30 y.	4 w.	M.	R.	Simple		U.				Imp.
LOWER THIRD (NEAR UNION OF EPIPHYSIS WITH DIAPHYSIS).											
11	22 y.	3 m.	M.	L.	Simple; lower fragment displaced forwards	Straight splints.	U.			Arm straight, but wrist stiff.	P.
12	14 y.	24 y.	M.		Simple		U.				P.
13	15 y.	25 y.	M.	L.	Simple		U.				P.
14	43 y.	3 m.	F.		Simple	Straight splints.	U.				P.
15	38 y.	6 w.	F.	L.	Simple	Smith's curved splint.	U.				P.
16	40 y.	5 w.	M.	R.	Simple	Curved splint.	U.	36 d.			P.
17	35 y.	6 w.	M.	L.	Simple	Straight splint.	U.	19 d.		Some swelling and stiffness remaining; no ensheathing callus at any period.	P.
18	37 y.	18 d.	M.		Simple	Straight splint.	U.	18 d.			P.
19	60 y.		F.	R.	Simple	Curved splint one week: after this, straight splint.	U.	25 d.			P.
20	17 y.	6 m.	M.		Simple		U.				Imp.
21	25 y.	5 y.	F.	L.	Simple	Four narrow splints.	U.			Hand falls to radial side; joint stiff, &c.	Imp.
22	25 y.	1 y.	F.	R.	Simple	Straight splint, but hand pressed over to ulnar side.	U.			Hand inclines to radial side; in other respects perfect.	Imp.
23	45 y.	5 m.	M.	L.	Simple	Straight splints.	U.			Hand inclines to radial side; some stiffness of joint.	Imp.
24	36 y.	1 y.	M.	L.	Simple	Curved splint one week; after this, no splint.	U.	5 w.		Erysipelas; stiffness of wrist and fingers; bone straight.	Imp.
25	60 y.	6 w.	F.	L.	Simple	Curved splint.	U.			Hand falls to radial side and back.	Imp.

LOWER THIRD (NEAR UNION OF EPIPHYSIS WITH DIAPHYSIS)—*Continued.*

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
26	56 y.	2 y.	F.	L.	Simple	Pasteboard splints.	U.			Hand falls to radial side; fingers stiff.	Imp.
27	10 y.	12 y.	M.	L.	Simple		U.		1 in.	Ulna displaced downwards.	Imp.
28	67 y	3 m.	M.	L.	Simple	Curved splint.	U.				Imp.
29	51 y.	1 y.	F.	R.	Simple		U.			Lower fragment inclines backwards; joint stiff.	Imp.
30	26 y.	4 y.	F.	L.	Simple		U.			Hand falls to radial side.	Imp.
31	48 y.	5 w.	F.	L.	Simple	Straight splints.	U.	32 d.		Hand inclines to radial side.	Imp.
32	43 y.	3 m.	F.	L.	Simple	Curved splint, and straight.	U.	28 d.		Ulna projects slightly; slight stiffness of joint.	Imp.
33	52 y.	3 y.	F.		Simple		U.			Hand bent to radial side and backwards; fingers contracted, &c.	Imp.
34	8 y.	1 y.	M.		Simple		U.			Hand inclines to radial side.	Imp.
35	29 y.		F.		Simple		U.			Hand inclines to radial side.	Imp.
36	56 y.	5 y.	F.	R.	Simple	Straight splints ten weeks.	U.			Hand falls to radial side; wrist and finger-joints stiff; arm very weak, &c.	Imp.

LOWER THIRD (FRACTURES COMMENCING ON THE RADIAL SIDE OF THE BONE, AND TERMINATING IN THE JOINT).

37	13 y.	5 m.	M.	R.	Simple	Straight splint.	U.				P.
38	38 y.	2 m.	M.	L.	Simple	Straight splint after the third day.	U.			Fragments in perfect line, but ulna projects a little, and joints remain stiff.	P.

REMARKS.

Of thirty-eight fractures of the radius, not one was attended with such a laceration of the soft parts as to render it compound. Twenty-three occurred in males, and fifteen in females; seventeen are known to have belonged to the left arm, and eight to the right; all have united. Three occurred in the upper third, two in the middle third, and thirty-three in the lower third. All of the three occurring in the upper third are believed to have been fractures of the neck.

I am aware of the infrequency of the fracture of the neck of the radius, and of the difficulty of diagnosis. Both B. Cooper and Mr. Smith have alluded to this difficulty of diagnosis, and the case reported by Dr. T. M. Markoe to the New York Pathological Society, and published in the April number of the Amer. Med.

Monthly for 1856,[1] will serve especially to illustrate the same point; in which case the signs of a fracture of the radius at its neck were such as to deceive that experienced surgeon, yet the autopsy disclosed the fact that it was a dislocation of the head of the radius forwards, with a fracture of the ulna. Indeed, its existence as a form of fracture has been doubted by Sir Astley Cooper, and by others actually denied. I have seen no other specimens obtained from the cadaver, except the doubtful one contained in Dr. Watts' cabinet, and of which I have furnished a drawing; and the specimen owned by Dr. Mütter of Philadelphia (Pl. I. Fig. 3). Nor do I remember to have seen elsewhere a record of any other specimen. Malgaigne affirms, with his usual frankness, that although he has occasionally believed that he had met with it, the autopsy, whenever it has been obtained, has shown that it was rather a subluxation than a fracture. On the other hand, Mr. South calls it "a not unfrequent accident," but, in confirmation of this declaration, he cites no examples.

While, therefore, the presence of what appear to be the rational diagnostic signs has compelled me to record three cases as fracture of the neck of the radius, I have not so much confidence in my own skill, nor indeed in the skill or judgment of any other man, as to think that we ought to affirm positively of these accidents, lest, as has happened many times before, in the final appeal to that court whose judgment waits until after death, our decisions should be reversed.

When this fracture occurs, the upper end of the lower fragment is carried forwards by the action of that portion of the biceps which has its insertion into the tubercle; and the displacement in this direction must necessarily be increased in proportion as the arm is straightened. Such has been the character of the displacement in all of the examples I have seen, except in the case of the specimen in the possession of Dr. Watts; in which instance the upper fragment alone has suffered a change of position, a malposition so peculiar as to have been determined, no doubt, by the same cause which produced the fracture. In the Mütter specimen, the lower end of the upper fragment is drawn forwards with the upper end of the lower fragment.

Only one of the three cases reported was uncomplicated, Case 2 being complicated with a fracture of the external condyle of the humerus, and Case 3 with a dislocation of the ulna.

[1] See also N. Y. Jour. of Med., vol. xvi. (New Series), p. 271.

In all of the cases, the upper end of the lower fragment remains displaced forwards, the hand is proned, and flexion and extension at the elbow-joint are imperfect. In the first case, the fragments were properly reduced by the surgeon, but a displacement occurred when the patient prematurely straightened the arm.

I have seen, in Dr. Mütter's cabinet, two specimens of fracture of the outer half of the head of the radius. In one case, the fragment is slightly displaced downwards in the direction of the axis of the bone, and in the other, the fragment is thrown outwards, or to the radial side. Both are united by bone.

Only two fractures have occurred in the middle third; an observation which is in striking contrast with the remark of Chelius that it is broken most frequently in its middle. In neither case has the result been entirely perfect, one case having left a slight impediment in the power of pronation and supination, and the other presenting a forward displacement of the fragments.

Of the thirty-three fractures belonging to the lower third, twenty-six were near the lower end, or within from half an inch to one inch and a little more, from the articular surface; all being included in those fractures called "Colles' fractures," and which may be either separations of the epiphyses or true fractures.

Colles described this fracture as occurring about one inch and a half above the carpal end of the bone; but Robert Smith, of Dublin, who has carefully examined all the specimens he could find, about twenty-three in number, has never seen the line of fracture removed farther than one inch from the lower end of the bone, and in several cases it is within one-quarter of an inch of this extremity. Dupuytren has also described the fracture as occurring at from three to twelve lines above the joint.

The observations of M. Vollemier also have shown that, instead of being oblique, as has generally been supposed, the fracture is almost uniformly transverse from the palmar to the dorsal surfaces of the bone, and only occasionally slightly oblique in its other diameter, or from the radial to the ulnar side. I have seen, however, at the College of Physicians, of Philadelphia, a specimen of this fracture in which the line of fracture is transverse, from side to side, but very oblique from before backwards, and from below upwards. There is also a line of incomplete fracture extending into the joint, in the direction of Barton's fracture. It is united by bone, with the usual displacement backwards.

The observations of both Smith and Vollemier have shown, moreover, that the displacement of the lower fragment is seldom sufficient to enable it to escape completely from the upper; and that when, in extremely rare instances, and in consequence of extraordinary violence, such complete separation does occur, a disruption of those ligaments which attach the lower fragment to the ulna occurs also, and the deformity becomes at once very great, so that it no longer presents the peculiar features of Colles' fracture, but resembles rather a dislocation.

In the so-called Colles' fracture, the lower and outer border of the radius, or its styloid apophysis, is swung around or tilted, as it were, upon the ulna; the lower and inner border of the same fragment being retained in place by the radio-ulnar ligaments, which do not usually suffer a complete disruption, but only a stretching or partial laceration. The upper or broken margin of the lower fragment, and also the ulnar margin, undergo very little displacement; while the lower or articular surface, and the radial margin are carried backwards, upwards, and outwards.

Surgeons have spoken of a falling in of the upper end of the lower fragment towards the ulna, as an almost inevitable result of the action of the pronator quadratus, and against which tendency they have sought carefully to provide; but there is much reason to believe that any degree of displacement in this direction is a rare event, and that, when it does exist, it is in consequence mostly of the direction of the force which has produced the fracture, rather than of the action of this muscle, only a few of the fibres of which are usually attached to the lower fragment, and in some instances, where the fracture is within a half or a quarter of an inch of the articulation, not any. Besides, there is actually in these latter cases no interosseous space into which the fragment may fall, and its displacement towards the ulna becomes, therefore, impossible.

Still, however, if one were disposed to speculate upon the condition of these parts after the fracture, it might perhaps be easy to persuade ourselves that the action of the pronator quadratus upon the upper fragment, whose broken extremity was not completely or at all disengaged from the lower, would carry both fragments together towards the ulna. But whatever might be the result of our speculations, still the fact, as proved by specimens, is not generally so: and this is not the first time that facts and theories have disagreed. The truth is that it is exceedingly unusual to find in

any of the museums a specimen of this fracture having thus united. They may be found constantly tilted back in the manner I have described, occasionally tilted forwards, and, still more rarely, slightly displaced upon their broken surfaces antero-posteriorly; but it has never occurred to me, except in one, or at most in two instances, to see a specimen in which the upper end of the lower fragment was thrown towards the ulna, so as in any measure to encroach upon the interosseous space.

The almost uniform absence of this latter form of displacement may find its explanation in the direction of the force which generally produces this fracture, in the occurrence of the fracture sometimes at a point so low as to render its displacement in this direction impossible, and in the breadth of the bone at the seat of fracture, which does not permit it to fall laterally without actually increasing its length; a circumstance which its secure ligamentous attachment to the ulna at its opposite extremities, and its complete apposition to the wrist and elbow-joints, do not allow.

The mistake of those surgeons who have attempted to describe this fracture has originated in the appearance presented in nearly all recent fractures occurring at this point. The hand falls to the radial side, and seems to carry the lower end of the lower fragment with it, while the lower end of the ulna becomes unnaturally prominent in front and to the ulnar side; a condition of things which has naturally enough been ascribed to the displacement of the upper end of the lower fragment in the direction of the interosseous space. But this same radial inclination of the hand, and prominence of the ulna are present frequently when the radius is broken at its lower end and no displacement in any direction has taken place; and I have even observed it in simple sprains of the wrist, and in the hands of old or feeble persons where all the ligaments have become relaxed. It is seen, however, in a more marked degree when the bone is actually both broken and displaced backwards in its usual direction. In short, the deformity in question is due, in a large majority of instances, to the relaxation, stretching, or more or less disruption of the radio-ulnar ligaments, which permits the hand to fall to the radial side by a simple rotatory movement over its articular surface. For this reason, also, because these ligaments once lengthened or broken can never, or only after a lapse of many years, be completely restored, this deformity may be expected to continue, however exact and perfect may be the bony union.

It must be added, however, that, so long as the tilting remains, the articular surface is actually presenting somewhat to the radial side. While in the normal condition it presents downwards, forwards, and inwards, it now presents, when the displacement is considerable, downwards, backwards, and outwards.

Diday maintained that there existed usually in this fracture an overlapping or shortening of the bone in its entire diameter, and Vollemier thought that the specimens which he had examined proved that an impaction was almost universal.

Both of these opinions, it seems to me, have been successfully combated by Dr. Robert Smith: the shortening observed by Diday being found only on that side of the bone to which the lower fragment inclines, and being the result of the motion of the lower fragment already described; and the appearance of impaction being due to the ensheathing callus which is deposited usually, if the displacement is allowed to continue, in the retiring angle, opposite to the seat of fracture.

These are questions, however, requiring for their decision a very careful study of specimens, and in relation to which further observations may be necessary.

Meanwhile there is no doubt that occasional examples may be found illustrating one or more of all these varieties of displacement, and that to the impaction is sometimes added a comminution of the lower fragment, the lines of fracture extending freely into the joint. In Pl. I. Figs. 4 and 5, I have given a drawing of a specimen contained in Dr. Henry H. Smith's cabinet, at Philadelphia, the direction of the fracture being oblique from the radial side and terminating in the joint.

Dr. Robert Smith has described a fracture occurring at the same point,[1] and probably possessing the same characters as Colles' fracture; in which, the lower fragment is thrown forwards instead of backwards, and which has generally been the result of a fall upon the back of the hand. There is no such specimen, however, in any of the pathological collections in Dublin, nor has Dr. Smith ever seen a specimen obtained from the cadaver, although he reports a case which fell under his observation in practice.

I have myself reported one such case (Case 11), but I regret to

[1] Treatise on Fractures in the Vicinity of Joints, by Robert Wm. Smith, Dublin, 1854, pp. 162–3.

say that my examination of the condition of the arm was not such as enables me to add anything to the information already possessed upon this subject; indeed, until we shall have an opportunity of studying it in the cadaver, we cannot speak very definitely of its anatomical characters.

Nélaton[1] observes that all the varieties of this fracture which he has seen are often accompanied with fracture of the styloid apophysis of the ulna, and with a tearing of the triangular ligament. I am not aware that any other writer has made the same observation in relation to the frequent occurrence of a fracture of the styloid apophysis of the ulna, and I think the accident is not so common as the remark of Nélaton would lead us to suppose.

Fourteen of the examples of Colles' fracture seen by me occurred in females, and twelve in males. Five in the right arm, and fourteen in the left. The youngest was eight years old and the oldest sixty-seven.

In the first volume of the *Philadelphia Medical Examiner* (1838), will be found a description of a form of fracture occurring through the lower end of the radius, by J. Rhea Barton, of Philadelphia, which is probably much less common than Colles' fracture, and which had hitherto escaped the notice of surgeons. Its peculiarity consists in the line of fracture extending very obliquely from the articulation upwards and backwards, separating and displacing the whole or only a portion, as the case may be, of the posterior margin of the articulating surface. I have not recognized this fracture in any instance which has come under my own observation, nor have I been able to find a cabinet specimen in any pathological collection.

In relation to the prognosis in fractures occurring near the lower end of the radius, it will be observed that of twenty-eight cases, all of which were simple, not one has refused to unite, but only eleven have left no perceptible deformity or maiming after periods ranging from five weeks to twelve years. Some of these are marked as imperfect, notwithstanding the fact that the examination was made at a very early period after the union of the bones was consummated, and before the stiffness in the joints had been allowed a reasonable time to disappear; but I think it will be admitted that in this I have done no injustice to the objects of my investigations, since I have not marked any case as imperfect, unless there remained

[1] Pathol. Chirurg., tom. i. p. 741.

also a malposition, and generally, not unless the hand fell to the radial side; conditions which, my experience proves, are not materially changed by lapse of time.

In Case 27, there is an overlapping of the fragments and shortening of the forearm one inch; the radio-ulnar ligaments being completely torn asunder, and the ulna dislocated downwards to the same extent. In two cases stiffness of the wrist and finger-joints remains after one year; in one case after two years; in one case after three years, and in two cases after five years.

The deformity which has been observed most often, and indeed with only rare exceptions—being found in some degree, more or less, in several of those cases which I have marked as perfect—consists in a projection of the lower end of the ulna inwards, and generally a little forwards. In a large majority of cases, this is accompanied with a perceptible falling of the hand to the radial side, while in a few it is not. After this, in point of frequency, I have met with the backward inclination of the lower fragment. Robert Smith found this displacement almost constant in the specimens examined by him; and it is very probable that nearly all of the examples examined by myself would present more or less of the same deviation upon the naked bone; but in the living examples a slight deviation would be concealed by the numerous tendons which cover this part of the arm, and perhaps by some permanent effusions, of which I shall speak more particularly presently.

There remains for a long time, in a majority of cases, a broad, firm, uniform swelling on the palmar surface of the forearm, commencing near the upper margin of the annular ligament, and extending upwards two inches or more. This swelling continues much longer in old and feeble persons than in the young and vigorous. It is pretty generally proportioned to the amount of anchylosis existing at the wrist and finger-joints, and it disappears usually, *pari passu*, with these conditions. There can be no doubt that this phenomenon is due to an effusion, first serous, and subsequently fibrinous, along the sheaths of the tendons: and it is equally present after sprains and other severe injuries about this part, as in fractures. In many cases, however, its prolonged continuance and its firmness have led to a suspicion that the bones were displaced, a suspicion which only a moderate degree of care in the examination ought easily to dispel.

A similar effusion, but in less amount, is frequently seen also on

the back of the hand, below the annular ligament. When both exist simultaneously, the appearances of deformity and of displacement are greatly increased.

Here, then, we shall find a sufficient explanation of the anchylosis in the wrist and finger-joints, which, often for a time almost complete, continues occasionally many months, or even years, if indeed it is not perpetual: an anchylosis, produced not, as has generally been affirmed, by an extension of the inflammation to these joints, but simply by the inflammatory effusions and consequent adhesions along the thecæ and serous sheaths, through which the tendons all pass in their course to the hands and fingers. The fingers are quite as often thus anchylosed as the wrist-joint itself, a circumstance which is quite inexplicable on the doctrine that the anchylosis is due to an inflammation in the joints. Indeed, I have seen the fingers rigid after many months, when, having observed the case throughout myself, I was certain that no inflammatory action had ever reached them.

Nor is it any more difficult to show, I think, that the anchylosis of the wrist-joint is not due to a malposition of its articular surfaces, as has often been asserted in the written treatises, and reaffirmed by excellent surgeons when recording their testimony under oath: for, if the anchylosis of the fingers in all these cases is known not to be the result of malposition of their joint surfaces, but only of inflammation of the tendinous sheaths, why shall we refuse to accept the same explanation for the anchylosis at the wrist?

The most superficial examination of the mechanism of this joint ought to satisfy us that any moderate, or even considerable malposition of the lower fragment, after a fracture of the radius, is not sufficient in itself to occasion anchylosis. It is true that the direction of the articular surface of the radius is changed also, and that, while it was directed downwards, forwards, and to the ulnar side, it is now, perhaps, directed downwards, backwards, and to the radial side. But of what consequence is this, so long as the carpal bones, with which alone this bone is articulated, preserve their relations to the radius unchanged?

I suspect it will be found very difficult for any one, however ingenious, to offer even a plausible argument in defence of this doctrine of anchylosis, as applied to this fracture, so long and so positively affirmed that to-day it is thought to be established.

But, if any other evidence than such as I have furnished be

demanded, it may be supplied by the experience of most surgeons; in examples of anchylosis without displacement; in examples of displacement without anchylosis, but in which the anchylosis has yielded gradually to the lapse of time, while the displacement has continued. Examples also of all these results, so incompatible with the supposition named, have been given in this report.

To what I have already said as to the prognosis in these accidents, I may be permitted to add the opinion of our distinguished countryman Dr. Mott, given in a clinical lecture before his class in the University of New York.

"Fractures of the radius within two inches of the wrist, where treated by the most eminent surgeons, are of very difficult management so as to avoid all deformity; indeed, more or less deformity may occur under the treatment of the most eminent surgeons, and more or less imperfection in the motion of the wrist or radius is very apt to follow for a longer or shorter time. Even when the fracture is well cured, an anterior prominence at the wrist, or near it, will sometimes result from swelling of the soft parts, &c."

To which the reporter, himself a surgeon in the city of New York, adds:—

"As the above opinion of Professor Mott coincides with my own observations, both in Europe and in this city, as well as with many of our most distinguished surgical authorities, I venture to hope that it may assist in removing some of the groundless and ill-merited aspersions which are occasionally thrown on the members of our profession by the ignorant or designing."[1]

In fractures of the radius occurring at the neck, the forearm must be flexed upon the arm, and the hand supined. (See remarks on Fractures of the Radius and Ulna.) A single dorsal splint, properly padded, should support the forearm, while the surgeon, having laid a compress over the upper end of the lower fragment, proceeds to secure the whole with a roller. The forearm and hand being then placed in a sling, the dressing is completed.

Especial care must be taken to prevent the forearm being extended before the bony union is fairly consummated, lest the action of the biceps, now contracted and shortened, should draw the lower fragment forwards, as it must inevitably do while the union is imperfect; an accident which, there is reason to believe, occurred in

[1] Boston Med. and Surg. Journ., vol. xxv. p. 289, Oct. 1841. See also p. 294 of same journal.

Case 1 as late as the 28th day, resulting in a permanent displacement of the bone.

If the patient is a child, or if there is any probability that these rules will not be faithfully complied with, it would be well to secure the arm in this position with a right-angled splint.

If the fracture takes place at or near the middle of the bone, the same rules of treatment, with only slight modifications, will be applicable as in fractures of both bones. Two straight long and broad splints must be applied after being very carefully padded; and especial attention should be paid to the tendency of the fragments to become displaced forwards through the action of both the biceps and the pronator radii teres: a tendency which may, in some measure, be provided against by flexion of the arm. Case 5 will illustrate this observation.

It is only in the treatment of fractures occurring near the lower end, that modern surgeons have thought it necessary to introduce an essential modification; which consists in employing a pistol-shaped, instead of a straight splint, and by means of which the hand is thrown more or less strongly to the ulnar side.

Heister[1] speaks of inclining the hand towards the ulna, while reducing a fracture of the radius, but when the reduction has been effected he recommends a straight splint.

Among the first to advocate the permanent confinement of the hand in this position, were Mr. Cline, of London,[2] and M. Dupuytren, of Paris.[3] Mr. Cline, and after him Bransby Cooper[4] and Mr. South,[5] recommend the ordinary straight splints for the forearm, but the rollers by which the splints are secured in place are not permitted to extend lower than the wrist; so that, when the forearm is suspended in a sling, in a state of semi-pronation, the hand shall fall, by its own weight, to the ulnar side.

Dupuytren,[6] and after him Chelius,[7] adopt, in addition to the palmar and dorsal splints, the "attelle cubitale," or ulnar splint, which is a gutter composed of steel, iron, tin, or some other metal, and made to fit the ulnar margin of the forearm and hand, when the

[1] De Lavrentii Heisteri, Institutiones Chirurgicæ. Pars Prima, p. 202. Amsterdam ed.

[2] Traité des Fractures, etc., par Malgaigne, tom. i. p. 614. Paris ed.

[3] Dupuytren on the Bones. London ed., p. 140.

[4] Lectures on Surgery, by Bransby Cooper, p. 232, Amer. ed.

[5] Note to Chelius's Surgery, vol. i. p. 613.

[6] Dupuytren on the Bones.

[7] Chelius's Surg., vol. i. p. 613.

hand is drawn forcibly to the ulnar side. Blandin,[1] Nélaton,[2] and Goyraud,[3] also, under certain contingencies, employ the same. An instrument similar to this, also, but constructed of wood and gutta percha, and less curved down to the ulnar side, has been invented by Welch. (See Pl. II., Fig. 6.)

Most surgeons, however, employ either a palmar or a dorsal splint, or both palmar and dorsal splints, constructed with a knee, or pistol-shaped, and they thus avoid the necessity of the ulnar splint. Thus Nélaton,[4] Robert Smith,[5] and Erichsen,[6] recommend this peculiar form only in the dorsal splint; while Bond,[7] Hays,[8] and Ellory P. Smith,[9] place the pistol-shaped splint against the palmar surface of the forearm and hand.

A few modern surgeons have not seen fit to adopt this peculiar principle of treatment, or this form of dressing, under any of its modifications. Colles[10] recommends a straight palmar and dorsal splint, and does not incline the hand. Barton[11] advises the same, and Mr. Skey,[12] of London, having declared his preference for a couple of broad, straight splints, adds: "Great care should be taken to prevent the hand falling, and this object will be attained by inclosing the entire forearm and hand in a well-applied sling."

Professor Fauger, of Copenhagen, has undertaken to treat this fracture in some sense without any splint, the forearm and hand being simply laid over a double inclined plane, so as to bring the wrist into a state of forced flexion. "The hand having been brought into a position of strong flexion, the forearm is placed, pronated, on an oblique plane, with the carpus highest, the hand being permitted to hang freely down the perpendicular end of the plane."[13] M. Velpeau, in a report of his surgical clinic at La Charité, for the year ending September, 1846, says this plan has been tried during the year, and "the result has not been very satisfactory. The

[1] Malgaigne, tom. i. p. 614.
[2] Elémens de Path. Chir., par A. Nélaton, Paris ed., tom. i. p. 747.
[3] Ibid., p. 746.
[4] Ibid., p. 747.
[5] Treatise on Fractures, by Robert W. Smith, Dublin ed., p. 168.
[6] Surgery, by John Erichsen, Amer. ed., p. 215.
[7] Amer. Journ. Med. Science, April, 1852. (See Pl. IV., Fig. 1.)
[8] Ibid., Jan., 1853. (See Pl. IV., Fig. 2.)
[9] Buffalo Med. Journ., vol. ix. p. 225. (See Pl. IV., Figs. 3, 4.)
[10] Lectures on Surgery, by Abraham Colles, Amer. ed., p. 325.
[11] Philadelphia Med. Exam., 1838.
[12] Operative Surgery, by Frederick C. Skey, Am. ed., p. 161.
[13] London Lancet, May 8, 1847.

experiment, however, has not been decisive upon this mode of treatment."[1]

Notwithstanding these exceptions, the practice seems to be pretty well established among the leading surgeons everywhere to employ in the treatment of this fracture the principle of adduction of the hand, and always to the attainment of the same purpose, namely, rotary extension, by which they hope to retain more securely the lower fragment in place.

We come now to consider how far this peculiar treatment is capable of answering the special indications of the case we are studying.

It is assumed, as I have already intimated, that by bearing the hand strongly to the ulnar side, the fragments of the radius are brought more exactly into apposition, and more easily and effectually retained; an assumption, which supposes two things to have been determined: first, that there exists an overlapping of the fragments, either through the whole extent of their broken surfaces, or especially towards the radial side, or that the upper end of the lower fragment is inclined to fall against the ulna, or that all of these several conditions coexist; and secondly, that if such displacements do exist, they can be remedied by this manœuvre.

The first of these suppositions seems to have been sufficiently considered, and fully controverted by all those gentlemen who have particularly examined the specimens contained in the various pathological collections, and to whose careful investigations I have already repeatedly adverted. My own observation confirms also their statements. With rare exceptions, none of these displacements have been found to exist, although, as has been observed, a casual inspection of the arm when recently broken would often lead to an opposite conclusion.

In regard to the second supposition, namely, that where such displacements do exist, a forced adduction will aid in the retention of the fragments, I shall have to speak more cautiously, because, so far as I know, my opinions have received as yet no public and authoritative indorsement.

In order that adduction may prove effective, there must be some point upon which to act as a fulcrum. It is of no use that we rotate the hand for the purpose of making extension unless there can be found a resistance or limit to the rotary motion. Such a

[1] Boston Med. and Surg. Journ., vol. xxxv. p. 213.

limit exists, no doubt, but to determine its availability we must ascertain its character and position.

It is not in the lower end of the ulna, for the ulna has no point of contact with the carpal bones, and when, in the natural state of these parts, the hand is inclined to the ulnar side, the lower end of the ulna rides freely downwards upon the wrist until arrested by the ligaments which unite it with the carpus, and by the capacity of the joint to move in this direction. When the lower end of the radius is broken, and the ligaments of the joint more or less torn, the ulna, although thrust downwards much further than it could ever descend in its normal state, still fails to find a support, and spreading wider and wider from the radius as it is thrust further upon the hand, no limit can be given to its progress in this direction. It was thus that, in Case 27, I found the ulna carried downwards one inch or more.

If the fragments overlap each other in their entire diameter, it is very certain then that a fulcrum could not be obtained upon any point of their broken surfaces; and if the fracture is transverse in its antero-posterior diameter, and transverse, or only slightly oblique in its lateral diameter, when once replaced, the surfaces must of necessity support themselves, and the indication in question cannot be present. If, again, the direction of the fracture is from before backwards and oblique, and reduction has been effected, no chance still remains to prevent the sliding off of the radial edge, if it is disposed to happen, by making use of the ulnar extremity of the broken surface as a fulcrum. If the radial side is inclined to fall off, what shall prevent the ulnar from doing the same? and how then can it, the ulnar side, be used as a fulcrum? It only remains to suppose an impaction of the radial margin of the broken radius without similar impaction of the ulnar margin, or a fracture extending very obliquely from the radial margin into the joint, as the sole examples in which the lower fragment can find a sufficient fulcrum upon which the rotary extension may operate. The first of these examples I have supposed without being aware of the proof of its existence, and the second is probably rare.

I have not spoken of the ligaments which bind the lower fragment to the lower end of the ulna, and the ulna to the carpal bones, viz: the radio-ulnar, and the internal lateral ligaments; which in the normal state of the parts constitute the centre upon which forced adduction expends its power, and which still continue to be the point of resistance, when the radius is broken. And this brings

me to the end and purpose of my inquiry. How feeble and uncertain must be a resistance which depends solely on these broken ligaments! and how painful to the patient must be an extension, sufficient to overcome the action of nearly all the muscles of the wrist, which is borne entirely by a few lacerated and inflamed fibres! Even in health this position, when forced, cannot be endured beyond a few seconds, and it must be difficult to estimate the sufferings which the same position must occasion when the ligaments are torn and inflamed.

I am not to be told that surgeons have not intended to teach this extreme practice; that they have never recommended forced adduction, but only a moderate and easy lateral inclination, such as can be comfortably borne. If they have not, then, they should not have spoken of making extension by this means. An easy lateral inclination has no power to do good so far as extension is concerned, any more than it has power to do harm. But the fact is that while a majority of surgeons have no doubt used less force than was hurtful, some have used more than was useful, or safe! Indeed, the sharpness of the curve given to the splints figured and recommended by Dupuytren, Nélaton, and others, sufficiently indicate that their distinguished inventors intended to accomplish by these means a forced and violent adduction.

Malgaigne, speaking of other means of extension applied to the forearm, suggested by M. Godin, M. Diday, M. Huguier, and M. Velpeau, intended to operate only in a straight line, and alluding especially to the modes devised by Huguier and Velpeau, remarks: "Sans discuter autrement le valeur comparative de ces deux appareils, je crains qu'ils ne soient bien penables à supporter pour les malades; et M. Diday nous apprend que, dans les essais qu'il a tentés, la douleur déterminée par l'extension était si forte qu'il fut obligé d'y renoncer."[1] Which remarks cannot but apply with equal force to this, or to any other means of extension which may be adopted.

After all, it must not be inferred that I have concluded to reject this mode of dressing in all of its modifications: for although I am far from being persuaded of its utility as a means of extension and retention in any case, yet I am not prepared to deny to it some very considerable value in another point of view; and when judiciously employed it can certainly do no harm. It is, I repeat, for another reason altogether than the one heretofore assigned, that I would

[1] Op. cit., p. 616.

recommend its continuance: a reason which I cannot so well explain, or hope to render intelligible, except to the practical surgeon. This position throws the whole lower end of both radius and ulna outwards towards the radial margin of the splints, and by keeping the radius more completely in view, it enables the surgeon better to judge of the accuracy of the reduction, and to recognize more readily the condition and situation of the compresses, &c. This alone, I have always considered a sufficient ground for retaining the angular splint; although, as may be seen by a reference to my cases, I have treated a number of arms satisfactorily with the straight splints alone.

Finally, while surgeons have been seeking to accomplish an indication, the existence of which is at least rendered doubtful, and by means which appear to me totally inadequate, if it did exist, they have probably too often overlooked or regarded indifferently an indication which is almost uniformly present, namely, to press forwards the tilted fragment by a force applied upon the wrist from behind, and to retain it in place by suitable compresses. And I cannot help thinking that if they had regarded this as the sole indication, an indication generally so easily accomplished, they would have made fewer crooked arms, and have saved their patients much suffering, and themselves much trouble.

It only remains for us to determine the precise form of splint which ought to be preferred, and to describe its mode of application.

The narrow "attelle cubitale" of Dupuytren, is inconvenient; nor can I give the preference to the curved dorsal splint recommended by Nélaton, and employed by Robert Smith, Erichsen, and others. It is not to me a matter of entire indifference, in case only one curved splint is employed, whether this be applied to the palmar or dorsal surfaces of the forearm. Foreign surgeons, so far as I know, have applied this splint to the dorsal surface, and the straight splint to the palmar; while American surgeons have adopted almost as uniformly the opposite rule—to whose practice, in this respect, I acknowledge myself also partial. It is to the curved splint rather than to the straight, that we mainly trust; not simply, or at all, perhaps, because of its form, but because the curved splint is also the long splint. This is the splint, therefore, which ought to be the most steady and immovable in its position. Now, the very irregularities of surface upon the palmar aspect of the forearm and hand, instead of constituting an embarrassment, enable us, when the

splint is suitably prepared, and adjusted, to fix it more securely. Moreover, upon it alone, after a few days, the surgeon may see fit to rely, and in that case it ought to be applied to that surface of the arm which is most tolerant of continued pressure. The palmar surface, as being more muscular, and as having been more accustomed to frictions and to pressure, must necessarily have the advantage in this respect. The palmar splint terminating also at the metacarpo-phalangeal articulations, instead of at the wrist, as the short straight splint must do when the hand is adducted, enables the hand to be flexed upon its extremity over a hand block, or pad of proper size.

Such are the not insignificant advantages which we claim for this mode over that pursued by our transatlantic brethren.

The block suggested first by Bond, of Philadelphia (Pl. IV. Fig. 1), is a valuable addition; since the flexed position is always more easy for the fingers, and in case of anchylosis this position renders the whole hand more useful.

Dr. E. P. Smith, of Buffalo, has modified and improved the splint invented by Bond, by substituting for the immovable, a movable knee, or joint, so that the angle of adduction can be increased or diminished at pleasure, and the same splint can be used upon either arm. For the body of the splint also, he has substituted for the inflexible wood, a thick, firm piece of felt, which having been warmed, may be moulded to the form and adapted to the length of any arm. This splint, as now described, is a modification of the splint invented by Dr. Smith some years ago, and of which he has furnished a description and a drawing, in the Sept. No. of the *Buffalo Med. Journ.* for 1853.

For myself, I am in the habit of preparing extemporaneously a splint from a wooden shingle which I first cut into the requisite shape and length; the length being obtained by measuring from the front of the elbow-joint, when the arm is flexed to a right angle, to the metacarpo-phalangeal articulations. It ought, indeed, to fall half an inch short of the bend of the elbow to render it certain that it shall make no uncomfortable pressure at this point; and the direction to measure with the arm flexed, is of sufficient importance to warrant a repetition. The breadth of the splint should be in all its extent just equal to the breadth of the forearm in its widest part, so that there shall be no lateral pressure upon the bones. If the splint is of unequal breadth, the rollers cannot be so neatly applied, and it is more likely to become disarranged. Thus constructed it

is to be covered with a sac of cotton cloth made to fit tightly, with the seam along its back; and afterwards stuffed with cotton batting or with curled hair. These materials may be pushed in and easily adjusted, wherever they are most needed, from the open extremities of the sac. While preparing, the splint must be occasionally applied to the arm until it fits accurately every part of the forearm and hand, only that the stuffing must be rather more firm a little above the lower end of the upper fragment. The open ends of the sac are then to be neatly stitched over the ends of the splint. This splint is now to be laid directly upon the skin without any intermediate compresses or rollers. (Pl. IV. Figs. 5 and 6.)

The advantages of this form of splint are easily comprehended. They consist of facility and cheapness of construction, accuracy of adaptation, neatness, permanency and fitness to the ends proposed.

The extemporaneous splint recommended by Dr. Isaac Hays of Philadelphia (Pl. IV. Fig. 2) is very similar, but it lacks the neatness and permanency of that which I have now described.

In all cases it is better to employ, also, at least during the first fortnight, a straight dorsal splint, of the same breadth as the palmar splint, and of sufficient length to extend from the elbow to the middle of the metacarpus. This should be covered and stuffed in the same manner as the palmar splint, except that here the thickest and firmest part of the splint must be opposite the carpus and the lower end of the lower fragment. It will answer the indications also a little more completely if, at this point, the padding is thicker on the radial than on the ulnar side.

Having restored the fragments to place, in case of Colles' fracture, by pressing forcibly upon the back of the lower fragment, the force being applied near the styloid apophysis of the radius, the arm is to be flexed upon the body and placed in a position of semipronation; when the splints are to be applied and secured with a sufficient number of turns of the roller, taking especial care not to include the thumb, the forcible confinement of which is always painful and never useful.

I cannot too severely reprobate the practice of violent extension of the wrist in the efforts at reduction, and that, whether this extension be applied in a straight line, or with the hand adducted. It has been shown that in a great majority of cases no indication in this direction is to be accomplished, and to pull violently upon the wrist is not only useless but hurtful. It is adding to the fracture, and to the other injuries already received, the graver pathological

lesion of a stretching, a sprain, of all the ligaments connected with the joint. I am persuaded that to this violence, added to the unequal and too firm pressure of the splints, are, in a great measure, to be attributed the subsequent inflammation and anchylosis, in very many cases.

The first application of the bandage ought to be only moderately tight, and as the inflammation and swelling develop in these structures with rapidity, they should be attentively watched and loosened as soon as they become painful. It must be constantly borne in mind that, to prevent and control the inflammation, in this fracture, is the most difficult and by far the most important object to accomplish, while to retain the fragments in place when once reduced, is comparatively easy and unimportant.

During the first seven or ten days, therefore, these cases demand the most assiduous attention; and we had much better dispense with the splints entirely than to retain them at the risk of increasing the inflammatory action. Indeed I have no doubt that very many cases would come to a successful termination without splints if only the hand and arm were kept perfectly still, in a suitable position, until bony union was effected.

I must also enter my protest against many or all of those carved splints which are manufactured, hawked about the country and sold by mechanics, who are not surgeons: with a fossa for each styloid process, a ridge to press between the bones, and various other curious provisions for supposed necessities, but which never find in any arm their exact counterparts, and only deceive the inexperienced surgeon into the neglect of the proper means for making a suitable adaptation. They are the fruitful sources of excoriations, ulcerations, inflammations and deformities.

CHAPTER IX.

ULNA.

Upper Third.

Olecranon Process.

CASE 1. *Simple fracture. Union by ligament. Result perfect.*

Trulis Hanson, of Norway, Europe, æt. 52, broke the olecranon process of the right arm by a fall. It was treated by a Norwegian surgeon.

May 30, 1855, one year after the accident, I found the fragment united by ligaments one-quarter of an inch in length, and the arm quite as useful as before.

CASE 2. *Simple fracture. Union by ligament. Result nearly perfect.*

John Carbouy, of Buffalo, æt. 18, works at the Eagle Furnace, fractured the olecranon process of the right arm.

It was dressed by Dr. James P. White, of Buffalo, with a straight splint, &c.

Nine years after the accident, I found the process united by a ligament half an inch in length, and he could nearly, but not perfectly, straighten the arm. In all other respects the limb was as before.

CASE 3. *Simple fracture. Union by bone. Result nearly perfect.*

Peter Chapin, æt. 14, fractured the olecranon process. Dr. Benjamin Smith, of Berkshire, Mass., dressed the arm.

Sixty-nine years after the accident, I found the process united apparently by bone. He could not, however, straighten the arm completely, or supine it freely.

CASE 4. *Simple fracture, with a fracture of the radius at its lower end.* (See case immediately following Case 36, in Fractures of Radius.) *Result perfect.*

Samuel Duchett, of Buffalo, æt. 14, while suffering from a fracture of the radius, fell upon the point of the elbow of the same arm.

Four days after this last accident, and two days after his admission into the hospital, the elbow was much swollen, but there was no crepitus, and he could nearly straighten the arm. On the sixth day we discovered, when the olecranon was seized and attempted to be moved, a distinct crepitus.

We extended the arm, and applied a gutta percha splint, which, after the fifth day, was renewed daily, and its angle at the elbow changed. Twenty-two days after the fracture occurred, the splint was removed, and the fracture was found united by bone, and the motions of the joint unimpaired.

CASE 5. *Fracture, complicated with dislocation of the head of the radius forward. Union by ligament. Result imperfect.*

Charles Angel, of Livingston Co., N. Y., æt. 15.

This case was treated by Dr. Lauderdale of Geneseo. Six months after the accident I found the radius in place, and the olecranon process united by ligament. He could not straighten the arm completely; the forearm remaining at an angle of 45° with the arm.

Below Coronoid Process (Upper Third).

CASE 6. *Simple fracture. Result perfect.*

John Cavender, of Canada, æt. 18, broke the ulna through its upper third. It was treated by Dr. Reynald, of Toronto Hospital.

I examined the arm one year after it had been broken. The arm was perfect.

CASE 7. *Simple fracture. Result nearly perfect.*

Rose Stanton, of Buffalo, æt. 46, broke the ulna through its upper third. It was dressed by a surgeon in Buffalo.

Nine weeks after I found a slight forward bend at the seat of fracture, and the lower end of the ulna unusually prominent, to the ulnar side. The wrist was quite stiff.

CASE 8. *Simple fracture. Result not perfect.*

Ellen O'Brian, of Buffalo, æt. 32, while carrying a tub in the winter, fell upon the ice and broke her left ulna at the lower end of the upper third. Dr. Bissel, of Buffalo, was called two days after. He applied two wide splints and a roller.

Three years after I found a marked deformity at the seat of fracture, and the lower end of the ulna projecting to the ulnar side. The arm was as useful as before.

CASE 9. *Compound fracture. Result perfect.*

Miss Short, of Buffalo, æt. 7, fell and broke the ulna about four inches below the elbow-joint. The fragments penetrated through the skin on palmar surface of arm.

I applied two straight splints, but the arm was so tender and swollen that I could not apply them very snugly.

On the 28th day I removed all dressings. She could supine and extend the forearm perfectly. At the seat of fracture there was a manifest projection.

One year after date I find the arm perfect.

CASE 10. *Simple partial fracture. Complicated with dislocation of radius. Result perfect.*

Elizabeth Carmody, of Buffalo, æt. 4, broke the ulna just below the root of the coronoid process. The head of the radius was also dislocated forwards. (Incorrectly reported in communication to N. Y. Med. Soc., as a fracture of the radius. See *Trans.* 1855, p. 53.)

I reduced the dislocation easily, but could not bind the fractured ulna so as to make it straight. I applied on the palmar and dorsal surfaces of the arm and forearm, angular splints made of binders' board, well padded: but in no way could I, by pressure, or by bandaging, accomplish a complete restoration of the fragments of the ulna, and at the end of a year the projection at this point was manifest. The functions of the arm were, however, perfect.

CASE 11. *Compound fracture. Complicated with dislocation of the head of the radius forwards. United, with deformity and displacement.*

John George Brindle, of Hamburg, N. Y., æt. 17, was struck by a locomotive and severely injured in various parts of his body, June 5, 1855. I saw him with Drs. Smith and Adams a few hours after the accident. The whole left arm was then greatly swollen. Crepitus was distinct, and we diagnosed a fracture of the ulna about three inches below its upper end. We suspected also a forward luxation of the radius, but in the condition in which we found the limb we did not think it best to attempt reduction. There was a wound which seemed to communicate with the fracture. The arm was laid upon a pillow and cool lotions were directed to be applied.

Two months later I found the ulna united, with fragments bent forwards and outwards towards the radius.

The head of the radius was dislocated, and lay in front of the lower end of the humerus. Forearm shortened three-quarters of

an inch. He could flex his arm freely to a right angle, and a little beyond; could straighten it perfectly. Hand slightly proned and could not supine it completely. There is a remarkable fulness above the olecranon, on the back of the arm, occasioned by the shortening of the triceps. His arm is quite strong and useful.

I am confident that any attempt to restore and retain the fragments or the dislocated radius in place would have occasioned great suffering, and probably the loss of the arm.

Middle Third.

CASE 12. *Simple fracture. Union with deformity.*

Richard Coleman, of Buffalo, æt. 39, fell and broke the right ulna near its middle, Jan. 3, 1854. He called immediately on me, and I found the fragments displaced backwards. I pressed upon them forcibly, and then applied a palmar splint, broad and padded, to the forearm and hand. I took especial pains by compresses nicely adjusted to retain the fragments in place. The arm was placed in a sling.

At the end of four weeks I removed the splints. The fragments were united and without any perceptible ensheathing callus, nor could I discover that the bone was not restored to its natural form.

Sept. 7, 1854. About eight months after the fracture, Mr. Coleman died of cholera, and I was permitted to make an autopsy. (See specimen in my collection.)

I found the fragments united with a very small amount of ensheathing callus, and the bone slightly bent in the same direction in which I at first found them.

CASE 13. *Simple fracture. Result imperfect.*

Samuel Giffone, of Belgium, æt. 30, fractured the ulna through its middle third. It was treated by a surgeon in Belgium.

Ten years after, I examined the arm. There was a slight bend at the seat of fracture, and supination was imperfect, the hand inclining to pronation. The strength of the arm was not impaired.

CASE 14. *Simple fracture, with dislocation of head of radius forwards. Result perfect.*

Michael O'Brian, of Buffalo, æt. 3, broke the ulna near its middle, and dislocated the head of the radius forwards. I reduced both fracture and dislocation and applied splints, &c.

It resulted, after six weeks, in a perfect arm.

CASE 15. *Simple fracture, with dislocation of the head of the radius. Result perfect.*

Henry Gale, of Buffalo, æt. 9, fell from his bed. Dr. Austin Flint and myself in attendance. We found the head of the radius dislocated forwards and the ulna broken near its middle. The bones were easily replaced. We applied an angular splint to the arm and forearm, and at the end of two weeks we substituted pasteboard. The head of the radius remained perfectly in place, but the ulna became slightly bent at the seat of fracture. The motions of the arm were perfect.

CASE 16. *Compound fracture, with dislocation of head of radius. Result perfect.*

Charles Clinton, of Buffalo, æt. 9, fell and broke the ulna near its middle, dislocating, at the same moment, the head of the radius forwards. The fractured ulna was pushed through the flesh and skin.

Dr. White, of Buffalo, and myself in attendance. The fragments were easily reduced. In a few weeks the ulna had united without deformity; a slight prominence remained, however, in front of the head of the radius.

More than five years later I examined the arm, and it was in all respects perfect.

CASE. (Not treated by a surgeon) *Simple fracture. Deformity.*

Margaret Leary, æt. 26, fell down stairs and broke the ulna of the left arm.

She was admitted to the hospital Nov. 21, 1853, suffering with excessive debility and a cold abscess near the shoulder-joint. She had not discovered the fracture of the arm. The ulna was broken near its middle, and the fragments displaced backwards. Crepitus and motion were still distinct. Owing to her very feeble and irritable condition, I applied no splints. She finally recovered and left the hospital without any note being made of the result.

Lower Third.

The following two cases are copied from a report of my clinic as published in the *Buff. Med. Journ.*, vol. iii. pp. 731–32.

CASE 17. *Simple fracture. Result perfect.*

"Wednesday, March 2d, 1848. Mrs. ———, aged about 25, fell

upon a log and struck upon the ulna about three inches above its lower extremity. This occurred several days since, but she has not presented herself for treatment until to-day.

"The arm was dressed with a graduated compress laid along the palmar and dorsal surface of the forearm, especial care being taken to fill up the depression immediately above the ball of the thumb and little finger. Two broad splints were applied, one upon the dorsal and one upon the palmar surface, and over these was turned a roller. Dr. H——— omitted the roller usually applied from the hand to the wrist, remarking that as the object was solely to prevent œdema, it could be of no service above the wrist, and that it might often do serious harm by pressing the broken bones against each other; and this might happen too when the roller was not applied at first unduly tight, since the subsequent swelling might be such as to tighten the roller injuriously at the seat of fracture. Omitting this first roller also we avoid all danger of that serious accident, a loss of the arm from sloughing, which has so frequently happened in the practice of the best surgeons. The circulation of the arm along its radial and ulnar sides is thus left wholly uninterrupted."

Two months from the time of the accident the arm was well, and perfect.

CASE 18. *Simple fracture. Result perfect.*

Mrs. E. Smith, aged about 26. "Mrs. S. fell yesterday from a loaded wagon and broke the ulna of the right arm, at the same point as the other patient; indeed, this is the point at which this bone is most frequently fractured. The hand is also, as in the other case, forcibly proned."

"The same dressings were applied, and the arm was laid in a sling against the side of the body, in a position midway between pronation and supination."

Three months after, the recovery was complete.

CASE 19. *Simple fracture. Result perfect.*

Phineas Williams, of Madison Co., æt. 39, had his left ulna broken about two inches from the lower end, by a direct blow. It was dressed by Dr. Havens, of Hamilton, Madison Co., N. Y.

One year after I found the bone considerably displaced at the seat of fracture; in all other respects the arm was perfect.

CASE 20. *Simple fracture of ulna, complicated with partial dislocation of radius. Result not perfect.*

E. H. Bartlette, of Homer, N. Y., æt. 21, was thrown from a wagon striking upon the back of the hand and wrist of the right arm, producing a partial luxation of the lower end of the radius backwards, and an oblique fracture of the ulna near the wrist. Dr. Ashabel Patterson, of Homer, saw it about two hours after, and reduced both the dislocation and fracture. The bones were easily retained in place by Gibson's splints. The dressing was continued six weeks.

Two years after the accident, whilst Mr. B. was a student of medicine under my instruction, I found the arm as strong and as useful as the other, but he could not supine it completely. The styloid process of the ulna projects so that the wrist is one-quarter of an inch wider than the other, and measures three-quarters of an inch more in its circumference.

CASE 21. *Comminuted fracture complicated with dislocation of the head of the radius. Result imperfect.*

John Lewis, of Montrose, Pa., æt. 25, broke his left ulna at two or three points, and at the same time dislocated the head of the radius forwards. Drs. Park and Patrick, of Montrose, were employed. I examined the arm two years after and found it shortened one inch; the ulna much bent forward below its middle, and the radius still displaced forwards.

CASE 22. *Fracture complicated with dislocation of the head of the radius forwards. Resulting in deformity.*

Oliver H. Perry, of Erie Co., æt. 26, fractured the ulna through its lower third and at the same time dislocated the head of the radius forwards. Dr. ——, of Aurora, was employed. Three months after the accident I found the radius unreduced, and the ulna bent at the seat of fracture. The motions of pronation and supination as well as of flexion and extension were nearly complete.

CORONOID PROCESS.

Cabinet Specimen.

Specimen. Dried. Adult. Broken transversely near the extremity. United by bone quite closely and not displaced. No ensheathing callus. (Charles Gibson, Richmond, Va.)

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	How united.	Length of uniting medium.	Remarks.	Perfect or imperfect.
UPPER THIRD (Olecranon Process).											
1	52 y.	1 y.	M.	R.	Simple		U.	Lig.	¼ in.		P.
2	18 y.	9 y.	M.	R.	Simple	Straight splint.	U.	Lig.	¼ in.	Could not straighten the arm quite as well as before.	P.
3	14 y.	69 y.	M.		Simple		U.	Bone		He could not straighten the arm completely, nor supine it freely.	Imp.
4	14 y.	1 m.	M.		Simple	Straight gutta percha splint.	U.	Bone		United in 22 days.	P.
5	15 y.	6 m.	M.		Complicated with dislocation of radius		U.	Lig.		Forearm remains at an angle of 45° with the arm.	Imp.
UPPER THIRD (Below Coronoid Process).											
6	18 y.	1 y.	M.		Simple		U.				P.
7	46 y.	9 w.	F.		Simple		U.			Slight forward bend at seat of fracture; lower end of ulna projecting slightly to ulnar side.	P.
8	32 y.	3 y.	F.	L.	Simple	2 wide splints.	U.			Bend at the seat of fracture; lower end of ulna projecting to ulnar side; arm as useful as before.	P.
9	7 y.		F.		Compound	2 straight splints.	U.				P.
10	4 y.		F.		Simple, partial, complicated with dislocation	Angular splints, &c.	U.			The fragments continued to press forwards, but functions of arm perfect.	P.
11	17 y.		M.	L.	Compound, complicated with dislocation	Rest and cooling lotions.	U.		¾ in.[1]	Head of radius remains displaced forwards; fragments of ulna bent forwards and outwards towards the radius; flexion and extension imperfect, &c.; arm quite useful.	Imp.
MIDDLE THIRD.											
12	39 y.	8 m.	M.	R.	Simple	Straight splints.	U.	4 w.		Very slightly bent backwards.	P.
13	30 y.	10 y.	M.		Simple		U.			Hand inclines to pronation; slight bend at seat of fracture.	P.
14	3 y.	6 w.	M.		Complicated with dislocation of radius	Splints.	U.				P.
15	9 y.	6 w.	M.		Complicated with dislocation of radius	Angular splints, &c.	U.			Ulna slightly bent at seat of fracture.	P.
16	9 y.	5 y.	M.		Complicated with dislocation of radius	Splints.	U.			The fracture was also compound.	P.

[1] Amount of shortening.

LOWER THIRD.

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	How united.	Amount of shortening.	Remarks.	Perfect or imperfect.
17	25 y.	2 m.	F.		Simple	2 broad splints, &c.	U.			Before dressing, the hand was prone.	P.
18	28 y.	3 m.	F.	R.	Simple	2 broad splints, &c.	U.			Before dressing, the hand was prone.	P.
19	39 y.	1 y.	M.	L.	Simple		U.			Some displacement of fragments.	P.
20	21 y.	2 y.	M.	R.	Simple	Gibson's splints.				Cannot supine hand perfectly; lower end of ulna projects to ulnar side, &c.	Imp.
21	25 y.	2 y.	M.	L.	Comminuted, complicated with dislocation of radius forwards		U.		1 in.	Radius remains dislocated; ulna much bent forwards at seat of fracture.	Imp.
22	26 y.	3 m.	M.		Complicated with dislocation of head of radius forwards		U.			Radius remains dislocated; ulna bent at seat of fracture; all the motions of the arm nearly complete.	Imp.

REMARKS.

Of twenty-two fractures of the ulna eleven belong to the upper third, five to the middle third, and six to the lower third; or, excluding the olecranon process and confining the analysis to the shaft, the upper and lower thirds have each six, and the middle third five.

Of fractures of the coronoid process I have seen no case of which I can speak at all positively.

I know also of but one specimen in the museums in this country, and this has been reported to me by Dr. Gibson of Richmond, Va., as being in his collection.

Sir Astley Cooper mentions that he has seen one specimen of this fracture upon the cadaver, broken off completely at its base and united by a ligamentous substance, which rendered it movable upon the ulna, and permitted the ulna to slide backwards upon the lower end of the humerus whenever the arm was extended. It was accompanied also with a fracture of the external condyle of the humerus.[1] Samuel Cooper, also, in his "First Lines," describes a specimen in University College Museum, in which both olecranon

[1] Treatise on Disloc. and Frac. of Joints, by Sir A. Cooper. Philada. ed., 1825. See also plate 17, fig. 2, of same vol.

and coronoid are broken off separately, and the radius is dislocated forward.

I have mentioned all of the well-authenticated cases of which I have any knowledge, but reports of supposed cases are by no means infrequent.

In addition to the cabinet specimen seen by Sir Astley Cooper, and which I have mentioned, he believes that he has seen one case upon the living subject. Mr. Liston also reports the case of a boy, who, suspending himself by his arms from a high wall, broke at length the coronoid apophysis through the action of the brachialis internus! Dr. Fahnestock reports a case in the *Amer. Journ. of Med. Sci.*, vol. vi. p. 267. Dr. Cooper, of the Glasgow Infirmary, reports one case in the *Lond. Med. Chir. Rev.* for Aug., 1829. In the *Amer. Med. Monthly* for October, 1855, is an account of a trial for malpractice, in which a lad nine years old received some injury about the elbow-joint, which resulted in a maiming. Dr. E. R. Peaslee, Prof. of Anat. in Dartmouth Col., thought it "altogether probable that the coronoid process had been broken." Dr. Crosby, Prof. of Surg. in the same college, could not decide positively. "He had never found a fracture of the coronoid process; still, it might exist here." Dr. Spalding, of Haverhill, was of the opinion that it was broken, and that there had been a dislocation of the elbow backwards. The defendant, Dr. Moore, claimed that there had been such a dislocation, and that either the trochlea of the humerus, or the coronoid process of the ulna, had been broken. The jury did not agree, and were dismissed, and before the next term of court a nonsuit was allowed by the court.

The defendant, in his report of the trial, justly complains that Mr. Fergusson, in his *Operative Surgery*, says (or is made to say) of backward dislocation of both bones of the forearm: "In such a case, the coronoid process will *probably* be broken." This was urged in the trial by plaintiff's counsel as contradicting the medical testimony, and charging a conspiracy on the part of the doctors to defeat the ends of justice, in saying that the accident was very *rare*.

Dr. Dorsey, in his *Surgery*, says that Dr. Physick once saw a case of fracture of the coronoid process; that the forearm was kept fixed at a right angle with the humerus, and the tendency of the brachialis muscle to draw up the superior fragment was counteracted in some measure by pressure of the roller above the elbow, and "that a *perfect cure* was *readily obtained*."

In the first work referred to, Mr. Fergusson's *Surgery*, perhaps the word "possibly" has given place to "probably."

In the latter, it may well be doubted whether the case is fairly represented by Dr. Dorsey, it not having come within his own observation.

In my report on dislocations, made to the New York State Med. Soc. in 1854, I have also reported the following case:—

CASE 17. *With fracture of the coronoid process.*

I have no notes of this case, and I am compelled, therefore, to recall it imperfectly from memory. ———, of Buffalo, aged about 25 years. I found this man upon a canal-boat, with a dislocation of the left radius and ulna backwards and upwards. Dr. ——— had reduced it, as he believed, the day before, and soon after the accident. The bones were now displaced again, and the arm much swollen.

By extension and counter-extension in my usual mode, I reduced the dislocation after a few minutes; but I immediately discovered that on releasing the arm, the dislocation was reproduced. I repeated my efforts to reduce and to retain it in place several times on this day and on subsequent days, but to no purpose, and the patient left me after a few days with the bones unreduced.

The impossibility of retaining the bones in place when reduced, and the existence of an occasional slight crepitus in the first trials, determine me in recording it as a dislocation, with fracture of the coronoid process.

Within the past year, another similar case has presented itself, in a child nine years old. The bones were displaced backwards, and could not be made to stay in place except by force. I suspected a fracture of the coronoid process, and having applied an angular splint, I left him in charge of an intelligent country surgeon, Dr. Morrow, with a request that he would permit me to see the child after recovery.

On the 14th of May inst., he called upon me, and it is now evident that the process was not broken. The radius and ulna are in place, the motions of the joint are perfect, and there is no evidence that the process was ever broken. I have no doubt it was not.

I am pretty well convinced now that none of these cases were examples of fracture of the coronoid process, and that the radius and ulna will often become displaced spontaneously, after simple dislocations, and where neither the humerus nor the coronoid pro-

cess is broken. There is too much disposition, I fear, on the part of all surgeons, to ascribe to extraordinary events, phenomena which are of difficult explanation; from which imputation I do not hold myself excused.

The case reported by Liston, in which the process was said to be broken by the action of the brachialis internus, has led to a frequent repetition of the opinion that it may, and often does so occur; but *malgré* the testimony of Mr. Liston, of Mr. Miller and others, I must be permitted to doubt whether this apophysis was ever detached by muscular action, since the brachialis internus is inserted not upon the process but at its base. Dr. Henry H. Smith, of Philadelphia, also, I believe, concurs with me in this opinion.

Of the five fractures of the olecranon process, three were united by ligament, the length of which in no case exceeded half an inch, and two were united by bone. In all of the examples the motions of the arm were nearly restored after a time, and only two are marked imperfect.

Of the six fractures, through the shaft of the bone in its upper third, only one is imperfect, and of the five through the middle third all are perfect, while of the six occurring through the lower third only one-half are perfect.

Of the whole number, including the olecranon process, six are imperfect and sixteen perfect. Of the thirteen simple, uncomplicated cases only one is imperfect.

In seven cases, the fracture was accompanied with a forward dislocation of the head of the radius, in three of which it remains unreduced. Of these seven cases, two belonged to the upper third, two to the lower, and three to the middle third.

In six cases there remains some displacement at the seat of fracture, of which two are displaced towards the palmar surface, one towards the dorsal, and one outwards towards the radius. The lower end, or styloid process of the ulna, is thrown inwards, to the ulnar side, in three cases. In three cases the forearm remains slightly proned, and in two it is mentioned that this was the position of the forearm, at the time of the first dressing. In no case was the forearm supined. In no case have I detected anchylosis between the radius and ulna; nor has the power of supination ever been completely lost.

The principles of treatment in fractures of the ulna seem to be so plain, and so well established, that I do not think it necessary

that I should say more than to refer you to the standard treatises upon surgery, for all the necessary information.

Malgaigne has made one observation, however, which, without having myself had an opportunity to confirm, I think it worth while to reproduce. Ordinarily the arm is to be placed in a position of semi-pronation, "but when the displacement is very considerable, and threatens to destroy the interosseous space, we must have recourse to supination, and the complete apparatus for fractures of the forearm. Supination is even sometimes necessary solely to insure contact and consolidation of the fragments." M. Fleary has published a case of this kind, treated by semi-pronation, in which the fragments remained ununited and displaced, and he could only maintain them in contact by placing the forearm in a position of supination.

The surgeon must also be cautioned against allowing the arm to fall downwards between the splints, when the radius is laid uppermost against the body, in consequence of which, sometimes the fragments are forced into the osseous space, and the arm remains permanently bent.

CHAPTER X.

RADIUS AND ULNA.

Upper Third.

CASE 1. *Simple fracture. Union perfect.*

John Winslow, of Buffalo, æt. 16, fell from a fence, Sept. 25, 1855, striking upon his hand, and breaking the radius and ulna at the junction of the middle and upper thirds.

It was dressed at the hospital, on the following day, by Dr. Smith.

October 3. Not yet united. I dressed the arm with two lateral splints.

This lad left the hospital on the 12th, seventeen days after the accident, and did not return.

I have since learned that it united without deformity or maiming.

Compound fracture. No surgical treatment. Resulting in great deformity.

Wm. Sharp, of Livingston Co., æt. 59, had a compound fracture of both bones near the upper ends. *No surgeon was employed.*

Five years after the fracture I found the forearm shortened one inch; the fingers very much contracted, and the power of supination and pronation completely lost. The arm was very feeble.

Middle Third.

CASE 2. *Simple fracture. Result perfect.*

John Bowles, of Ireland, æt. 25, broke both bones. They were dressed by an Irish surgeon.

After twenty-five years there existed no traces of the fracture.

CASE 3. *Simple fracture. Result perfect.*

George Booth, of Buffalo, æt. 11. Broken through the middle third. Dr. George Burwell in attendance. Five weeks after the fracture Dr. B. brought the child to me, the bones were united and straight. There was, however, considerable ensheathing callus at the seat of fracture.

CASE 4. *Simple fracture. Result perfect.*

T. B. Seelye, of Geneva, N. Y., æt. 11, broke the radius and ulna through the middle third.

The fracture was treated by Dr. Asher Nichols.

Eleven years after, the arm was in all respects as before the accident.

CASE 5. *Simple fracture. Result perfect.*

The late Prof. James Webster broke both bones of the right forearm near the middle, when about 10 years old. The arm was dressed and subsequently treated by the late Prof. Horner, of Philadelphia.

Prof. Webster permitted me to examine the arm while he was my colleague at Buffalo, more than 30 years after the accident. I could not discover where the fracture had occurred.

CASE 6. *Simple fracture. Result perfect.*

Margaret Casey, of Ireland, æt. 9, broke radius and ulna near the middle. It was treated by Dr. Little, of Ireland.

Ten years after the accident I found the arm completely sound and with no traces of the fracture.

CASE 7. *Partial fracture. Result perfect.*

Charles Allender, of Buffalo, æt. 2, fell from a chair bending the right forearm near its middle. He was brought to me soon after. The fragments were salient backwards.

I straightened the arm by using considerable force, and the restoration was accompanied with crepitus. After two months I found the arm in all respects perfect.

CASE 8. *Simple fracture. Result perfect.*

Thompson Maxwell, æt. 16, broke the right forearm near its middle, June 11th, 1853. It was treated, at first, by Dr. Gould, of Lockport. On the seventh day he came under the charge of Dr. George Burwell. Dr. B. found the whole arm inclined to the ulnar side from the point of fracture downwards. He straightened the arm and again applied splints, but at each subsequent dressing he found the fragments displaced in the same manner, and he as often restored them to position.

Five weeks after the accident, July 18, 1853, by request of Dr. Burwell, he called upon me. The fragments were united, but with the same displacement mentioned already. There was no appearance of ensheathing callus. Pronation and supination, with flexion and extension, were perfect.

April 16, 1856, nearly three years after, I find the arm perfectly straight, so that I could not say where the fracture had occurred; all of its motions are perfect, but forced supination causes a pain near the seat of fracture. The arm is strong and larger than the opposite arm.

CASE 9. *Simple fracture. Delayed union. Result perfect.*

John L. Snedaker, of Clyde, N. Y., æt. 26, fractured both bones of the left forearm, a little below its middle. E. Darwin Colvin, of Clyde, a careful, and experienced surgeon, was in attendance.

Dr. Colvin applied a palmar and dorsal splint, well padded and of sufficient length, extending from the elbow to the ends of the fingers. These dressings were continued eight weeks. At this time the ulna had united but the radius had not.

January 14, 1845, at the request of Dr. Colvin, the patient was brought to me. It was now three months since the fracture occurred,

and no union had taken place between the fragments of the radius. At my instance, Dr. Colvin rubbed the ends of the bone violently together, and then applied a graduated compress upon both the palmar and dorsal surfaces of the arm, over which and completely ensheathing the radial border, a felt splint was carefully moulded, extending from the elbow to the fingers, and with an opening to receive the thumb; over this a roller was laid as snugly as the patient could bear. The arm was then placed in a sling.

Three weeks from this time the arm was examined, and the union between the fragments was found to be tolerably firm. The limb was soon completely restored. Seven years later I found it still perfect in all respects.

CASE 10. *Simple fracture. Result imperfect.*

John H. Landon, of Pennsylvania, broke both bones near their middles.

The arm was treated by Dr. Canada, of Pa.; and after forty years I find that pronation and supination are imperfect, but that in all other respects the arm is as useful as the other.

CASE 11. *Simple fracture, and delayed union.*

Patrick Meehan, æt. 30, Dec. 26, 1855, broke the radius and ulna of his right arm, a little below their middle. His arm was caught between a hand-car and a locomotive. Both fractures oblique. I dressed the arm soon after the accident, but in consequence of the severe contusion, the arm was already so much swollen that it was impossible to apply the dressings very snugly.

The next morning he came to the hospital, and the dressings were tightened by stitching them over.

January 2 (7th day). I opened the dressings. Fragments in place. Applied two broad, straight, carefully padded splints.

10*th*. Retightened dressings by stitching.

16*th*. Removed and reapplied same splints.

30*th*. No union of fragments. Removed bandages and secured splints with tapes. The splints to be open most of the time.

About the 11th of February, I applied a firm starch bandage. At this time the ulna seemed to be united but not the radius.

April 15. Have continued splints to this time. Motion between fragments of radius still evident. Discontinued all dressings and directed cold bathings, &c.

CASE 12. *Simple fracture. Delayed union. Deformity, &c.*

Henry Mangen, of Alleghany Co., N. Y., fell on the ice, Feb. 25, 1854, and broke the left radius and ulna a little below their middle. Dr. L. M. Purple, of Wellsville, N. Y., dressed the fracture within an hour.

He applied carved splints to palmar and dorsal surfaces of forearm and hand. At the end of three weeks the ridge, intended to press between the bones on the palmar surface, had produced a line of ulceration along the whole length of the forearm. Dr. P. had been very attentive, and examined the arm frequently. At this time a slight deformity in the bone was manifest.

Two weeks later the case fell into the hands of Dr. Charles, a skilful surgeon, residing in Angelica, when the deformity had increased very much. Dr. Charles attempted to readjust the fragments, and seemed to have succeeded partially. He applied splints carefully, but at the end of a week it was as crooked as ever. By request of Dr. Charles the patient subsequently called upon me, June 27, 1854, about four months after the accident.

The whole forearm below the fracture was inclined strongly to the ulnar side, the broken ends of the ulna overlapping about one inch and a quarter, and the ends of the radius much less. The radius was firmly united, but the fragments of the ulna were slightly movable.

There was no appearance of ensheathing callus.

CASE 13. *Simple fracture. Loss of the forearm by sloughing.*

John, adopted son of Mrs. McGrath, alias Mrs. White, the "Buffalo candy woman," æt. 9. This unfortunate lad was a pauper, and had been by the county apprenticed to one of the worst women of the town. How much the boy was benefited and the county saved by this piece of economy, the sequel will show.

Friday, July 2, 1847. John fell from the top of a ladder, about 30 feet, to the ground, breaking his right radius and ulna in their middle thirds. The surgeon did not see him until four or five hours had elapsed.

Dr. A. then carefully reduced the broken bones and applied two broad splints, one on the palmar and one on the dorsal surface, both of which were covered and padded. The splints were secured by a roller.

The forearm was then placed in a sling, and he was instructed to remain quiet in the house.

3d. Dr. A. visited the patient, and examined the condition of the arm and hand, and found everything in order.

4th. Dr. A. did not call, but it being our national holiday, the lad spent the day in the street. On the 5th a medical student was sent to see him, but the student did not find him in. On the 6th Dr. A. called. The arm and the hand were then swollen and gangrenous, and on the same day I was requested to see the patient.

I found him in a very dirty apartment, lying upon a miserable bed. His right arm was resting upon a pillow, and gangrenous throughout its entire length. The dusky color, indicating gangrene in its inception, extended in the form of a crescent across the middle of the chest. The thumb and fingers were black. His countenance was good, and his intellect clear; his pulse 75 and soft; tongue clean; he had slept well the night before, and felt perfectly well.

I examined the splints and found them neatly made and carefully padded. Dr. A. had assured me that he had not applied the bandage too tight, and I had no doubt that he had informed me correctly, but I proceeded, notwithstanding, to interrogate those who were present at the time. M., a medical student, thought they were rather loosely than tightly applied. The boy and his mother said the same. The account which they gave of what, in their opinion, had produced the result, was as follows: Notwithstanding the surgeon's instructions that the boy should be kept in the house, he was out all of the 4th and most of the 5th of July, running about the streets, firing crackers, &c., with his arm, most of the time, out of the sling and hanging by his side. His mother had locked him into the house alone, but he crawled out of the window. On the morning of the 5th the mother noticed that his fingers were black, but she thought they were blackened with powder.

We ascertained also that the boy had a diarrhœa, which had continued several days.

We ordered, therefore, one-quarter of a grain of opium to be taken every four hours, and a yeast poultice to the arm.

8th. The gangrene still extending, pulse 124; feels well.

11th. Line of demarcation formed opposite shoulder-joint.

It is not necessary to follow this case so minutely to its close. A few days after, he was removed to the Almshouse, and the separation continued until the arm fell off at the shoulder-joint, and he at length completely recovered.

CASE 14. *Compound fracture. Union after about five months, with shortening, &c.*

Johanna Foley, of Buffalo, æt. 22, broke her left arm in the upper part of the middle third of the radius and ulna. Accident occurred July 5th, 1855.

One of the fragments was pushed through the skin. Violent erysipelatous and suppurative inflammation followed.

The arm was treated at first by Dr. George Burwell, of Buffalo. On the 15th of July she was admitted to the hospital and came under the care of Dr. Ellory P. Smith, one of the surgeons to the hospital. Only mild contentive measures could be employed for two months or more.

At the commencement of my service, October 1, 1855, I found the fragment, not united, and the arm shortened three-quarters of an inch. I directed all dressings to be removed, and that the arm should be bathed with cold water daily. The patient was also directed to sit up some each day.

On the first of November union had taken place. Elbow-joint was still stiff and the hand swollen.

Dec. 20. Nearly six months after the accident, she is still slowly recovering the use of her arm and hand. Fingers, wrist, and elbow, still remain quite stiff, and some swollen; yet she has been using passive motion since the first of October.

CASE 15. *Comminuted fracture. Union with shortening, &c.*

A Frenchman, aged about 35 years, fell from the Erie Canal Aqueduct, at Rochester. The fractures were oblique and comminuted. Dr. ——, of Rochester, was called.

The next day, I found the arm dressed with three short and narrow splints, without compresses, and the hand laid upon its palm. The fragments were displaced, and it was impossible to restore them to position. They were, therefore, left overriding, the forearm being placed in two broad splints, with compresses, &c. The bones united, with a shortening of half an inch, and with slight deformity.

CASE 16. *Partial fracture. No surgeon. Union with deformity.*

Maria Jordan, of Buffalo, æt. 4, fell on her hand, with the arm extended, and bent the radius and ulna near their middle. The mother immediately bent the bones back partly, and then called upon John W. Fox, a homœopathist. He applied splints, &c.

The mother brought her to me July 26, 1853. I found the bones much bent backwards at the seat of fracture, but firm. No en-

sheathing callus. Hand proned, and she could not supine it completely.

Lower Third.

CASE 17. *Partial fracture. Result perfect.*

Madison, of Buffalo, æt. 3, fell and partially broke both bones near their lower ends, May 2, 1849. Dr. Sprague requested me to visit the child with him. We straightened the bones easily. No splints were applied as we found no tendency to displacement. The arm was simply laid on a pillow and kept wet a day or two with cool water.

One month after, the arm was entirely well and without deformity.

CASE 18. *Partial fracture. Result perfect.*

Elizabeth McLevy, of Buffalo, æt. 18 months, fractured the radius and ulna of the right arm through their lower third, Aug. 15, 1849. The fracture was partial, being rather bent than fractured. The deformity was very marked.

I straightened the bones and applied a paste bandage, splints, &c., but soon finding that the dressing could not be kept in place, and that, indeed, they were not necessary, I discontinued them. It resulted in a perfect cure, within a month. One year later I found the arm in all respects like the other.

CASE 19. *Partial fracture. Result perfect.*

Edward Lamphier, of Buffalo, æt. 5, fell, Dec. 7, 1855, and broke the radius and ulna of the left arm.

Fracture at the upper end of the lower third, simple and transverse.

I found the lower fragments bent backwards and not overlapped. I straightened them with moderate force, and the restoration to a straight line was attended with a cracking sensation, as if some of the fibres of the bone had suddenly given way. The arm was now perfectly straight, and the fragments showed no tendency to become displaced.

I applied a padded, straight splint to the dorsal surface of the arm.

The following day Dr. Treat, of Buffalo, the family physician, took charge of the case.

It has united without deformity.

CASE 20. *Partial fracture. Result perfect.*

Catharine Winne, of Buffalo, æt. 6, fell on her right hand, Sept. 14, 1854. I found the arm very much bent backwards from a point about one and a half inches above the wrist-joint. Both bones were bent at the same point.

I was obliged to use great force to bend the lower fragments into line. It was accomplished without crepitus; and when restored the fragments showed no disposition to become again displaced. I applied, however, a single firm, well padded splint on the palmar surface of the forearm and hand, and placed the whole in a sling.

The result, after four weeks, was a perfect arm.

CASE 21. *Partial fracture of the radius and complete fracture of the ulna. Result perfect.*

Horace Parmelee, of Buffalo, æt. 8, fell through an unfinished building, May 28, 1855, and broke the left forearm about three inches above the wrist. The arm had been partly straightened by a gentleman before I arrived. I saw the lad within an hour. The fragments were salient forwards. With considerable force I bent the fragments into line, and the restoration was attended with a single audible snap and not a crepitus. The snap was felt and heard distinctly to proceed from the radius. I inferred that one bone had been completely broken off and the other only partially, and that in restoring the latter to form I had completed the separation. There was no tendency subsequently to displacement.

I applied one dorsal splint and placed the arm in a sling. The bones were firm in about twenty-one days, and the arm perfect.

CASE 22. *Simple fracture of ulna and bend of radius near their lower ends. Result perfect.*

Peter Dalton, of Buffalo, æt. 2, fell, March 1, 1852, breaking the ulna about an inch from its lower end and bending the radius at the junction of its epiphysis with the shaft.

I saw it immediately, and with moderate force succeeded in bringing the fragments into line. I applied no splints or dressings of any kind.

On the fourth day the child was examined by Dr. Pupikofer and myself. The fragments were not displaced.

I drew the arm from the sleeve and put it underneath the waist of the dress.

Four months later I found the arm perfect.

CASE 23. *Simple transverse fracture of the radius, with partial fracture of the ulna. Result perfect.*

Lad, living at Buffalo, æt. 14. Sent to my clinic, by Dr. George Burwell. His arm had been caught in some machinery three days before, but he had only to-day called upon the doctor.

The radius was broken and slightly displaced. The ulna was only bent. I easily straightened both bones, and we then applied two broad splints with compresses, &c.

It united in a short time without any deformity.

CASE 24. *Simple fracture. Result perfect.*

Wm. Powers, of Ireland, æt. 11, broke the radius and ulna of the right arm just above the wrist.

It was treated by Dr. Savage, of Waterford, Ireland.

Fourteen years after the accident I found the arm in no way deformed or maimed, except that he could not supine or prone it quite as fully as he could the other arm.

CASE 25. *Simple fracture. Result perfect.*

Peter McEvoy, of Buffalo, æt. 8, broke right forearm just above the wrist, Aug. 1, 1849.

I dressed the arm, after reducing the fracture, with a paste bandage.

One year after the accident the arm was perfect.

CASE 26. *Simple fracture. Result perfect.*

Horace Chase, æt. 12, broke both radius and ulna, through their lower thirds. Dr. Toby, of Rochester, in attendance.

After six years, I find no deformity except a slight forward inclination of the radius at the seat of fracture.

CASE 27. *Simple fracture. Perfect union.*

An Irish lad, in Rochester, æt. 7, fell from a tree and struck on his hand; the fracture occurred just above the wrist, and was in both bones nearly, or quite, transverse, being situated at the junction of the epiphysis with the diaphysis in the case of the radius, and a little above the epiphysis in the case of the ulna. It is not certain that the fracture was complete, as the fragments were never entirely displaced, but only bent forwards. The bones were easily reduced, and with two splints retained in place.

I saw the lad after about three months, and there remained no deformity.

CASE 28. *Simple transverse fracture. Result perfect.*

H. Tucker, of Fredonia, æt. 10. Fracture near the lower end. Dressed by Dr. Wallworth, of Fredonia. Mr. T. says that when the Dr. removed the splints there was so much deformity that he seriously thought of refracturing the bones, but he did not. During about four years, Mr. T. remembers that this deformity continued gradually to disappear.

Eighteen years after the fracture, when I examined the arm, it was perfect in form and function, and it would be impossible to say where the fracture had occurred.

CASE 29. *Simple fracture. Result imperfect.*

Samuel Duckett, of Buffalo, æt. 14. Admitted to the Hospital, January 28, 1849, with a fracture of the olecranon of the left arm, and also a fracture of the radius and ulna, about one inch above the joint. The fracture of the radius and ulna occurred four weeks before admission. Dr. F., a German Dr., said it was not broken.

At the time of admission the hand was inclined strongly to the radial side; it was also proned and could not easily be supined, and the lower end of the ulna projected to the ulnar side. No crepitus. The elbow was much swollen. I attempted to reduce the bones but could not. I applied, however, a broad, straight splint to the arm and forearm, laying the arm straight upon a pillow.

After several weeks the deformity at the wrist remained the same as at first.

CASE 30. *Simple fracture. Result perfect.*

George B. Parker, of Otsego, N. Y., when about 10 years old, broke his arm transversely. The bones were very much bent out of line at the time. It was dressed, and subsequently treated by Dr. Palmer, of Otsego.

Thirteen years after the accident, when Mr. P. was a student of medicine, I examined the arm. It was in all respects as perfect as the other.

CASE 31. *Simple fracture. Reduced after two weeks. Result perfect.*

Mrs. Bridget Burke, of Buffalo, æt. 30, fell on the palm of her hand in the winter. Dr. Felchmaker, a German Dr., and Dr. Davis, a botanic Dr., saw the arm within half an hour and again the next morning. Both gentlemen believed it was a sprain.

Two weeks later she came before my class. Both radius and

ulna were broken nearly transversely one inch above the joint. The lower ends of the upper fragments projected in front, and the hand was drawn backwards. The hand was inclined towards its palm, and could not be easily supined. I reduced the bones easily, and, in the presence of my students, applied one straight broad splint to the palmar surface of the arm and hand.

Four weeks from this I removed the dressings for the last time, and found the arm straight.

CASE 32. *Simple fracture, complicated with fracture of humerus. Result perfect.*

Mathew Rigany, of Buffalo, æt. 23 (see Case 8, fracture of humerus).

CASE 33. *Simple fracture. Refractured after two weeks. Result perfect.*

Lawrie, son of E. L., of Buffalo, æt. 9, fractured both bones through the lower third. No surgeon was called until two weeks had elapsed. I then found the bones overlapped and quite firmly united, and also very much bent at the seat of fracture (see cast in my museum, taken at this time). With moderate force I broke up the callus and restored the bones to place. After one year no deformity remained. I am not certain, however, but that some overlapping and shortening of the limb existed.

CASE 34. *Simple fracture. Result perfect.*

Hiram Nichols, of Chautauque Co., N. Y., æt. 16, fell upon his right hand, breaking the radius and ulna somewhat obliquely about three inches above the wrist. Dr. Brown, of Chautauque Co., was employed. The arm was dressed with two wide splints, &c.

Ten years after, when I examined the arm, the point of fracture could not be traced, but the lower end of the ulna projected to the ulnar side one quarter of an inch.

CASE 35. *Compound fracture. Result perfect.*

Anna Fero, of Buffalo, æt. 12, broke both bones of the right arm in 1851. The radius was broken about two inches, and the ulna about two and a half or three inches above the wrist. The ulna protruded through the skin at the point of fracture.

It was treated by Dr. C. H. Wilcox, of Buffalo. He employed a palmar and dorsal splint and also a right angled splint.

One year after the accident I could discover a slight elevation or ridge where the ulna was broken, but could not trace the fracture in the radius.

The motions of the arm were perfect.

CASE 36. *Simple fracture. Broken a second time at the same point. Result perfect*

Peter Tippeter, of Buffalo, æt. 32, broke his right arm in 1852, at the upper end of the lower third. Both fractures were exactly transverse and at corresponding points.

It was dressed by Dr. Charles H. Wilcox, of Buffalo. It united readily, and three months after while at work, he fractured it at the same point. Motion and crepitus were distinct.

After four months I find the arm perfect, and with a slight provisional callus at the point were the ulna was broken.

CASE 37. *Compound fracture. Result imperfect.*

James Hoffman, of Buffalo, æt. 10, broke the right arm, both bones, about two inches above the wrist, June 20, 1852, the ulna protruding through the skin.

The arm was dressed by Dr. Lewis, of Black Rock, but on the sixth day, by request of Dr. Lewis, I took charge of the case.

I found the arm much swollen, and the fragments inclining to the ulnar side. The hand prone. I applied one broad gutta percha splint, padded with cotton wadding, to the back of the hand and forearm.

After several weeks the bones united with but very slight deformity.

CASE 38. *Simple fracture, complicated with partial dislocation of radius and ulna at their lower ends. Result perfect.* (Copied from report on dislocations, made to New York State Med. Soc. 1855, p. 69 of *Transactions.*)

Lewis Colligan, of Buffalo, aged 18 years. Dr. Spaulding, of Williamsville, now deceased, was employed. Fourteen years after the accident I examined the arm. No evidence remained of the character of the injury but the shortening of the radius and ulna, which shortening was, by very careful measurement, one-third of an inch. This would imply that a fracture had existed, as declared by Dr. Spaulding. The patient, also, an intelligent man, remembers distinctly the circumstance, and that crepitus was heard and

felt. The partial dislocation of the bones forwards, he remembers also, as a circumstance distinct from the fracture. But, in addition to this testimony, and the testimony of his surgeon, who was a man of excellent reputation, there remained for a year a constant tendency to displacement in the same direction. Whenever he attempted to lift even the weight of half a pound with his hand supined, the lower end of the radius would spring forwards, and all power in the arm would be lost. When this happened, as it did quite often, he always reduced the bones himself by pushing on them.

At the time of my examination, the arm was in every respect perfect, except that it was shortened.

CASE. 39. *Compound comminuted fracture. Union with deformity.*

Charles Odell, a canal boat captain, æt. 36, broke both radius and ulna near the upper end of their lower third, Nov. 3, 1852. Fracture compound and comminuted.

The first dressing was made by Dr. Lewis of Black Rock. I dressed it myself on the following day with great care, using a broad, firm, and carefully moulded gutta percha splint, which I applied to the palmar surface. The wound was on the back of the arm. I dressed it again on the third day, and he then left for New York.

Sept. 22, 1853, about seven weeks after the accident occurred, Capt. Odell called on me. The fragments were then united, but from the seat of fracture downwards the arm is very much bent to the ulnar side. The arm is, however, pretty strong. Since he left me it has been dressed by Dr. Parker, in N. Y., and by Dr. Shipman in Syracuse.

CASE. 40. *Compound fracture. Result not perfect.*

Robert Gibb, of Buffalo, æt. 35. A heavy piece of iron fell upon his right arm July 25, 1853. Dr. Green and myself in attendance. The bones were broken obliquely near the upper end of the lower third. Wound on the palmar surface. Considerable hemorrhage. We applied a broad and carefully adjusted dorsal splint, and subsequently a palmar splint was also employed. Most of the dressings were made by myself, and the arm was seen every day. The utmost care was exercised both by myself and my patient to make a straight and useful arm.

The ulna united in the usual time, but the radius was not firm

until about the 29th of Sept (nine weeks). At this time I examined the arm very critically, and made a note that the limb was perfectly straight, but that there was slight ensheathing callus. Gradually, however, as the swelling continued to subside, we discovered that it was not straight. At the end of two weeks more the deformity was quite manifest; the arm being inclined to the ulnar side from the seat of fracture, downwards.

Three years after I find the arm looking much straighter. Functions perfect, except that he cannot supine it completely.

CASE 41. *Compound fracture. Non union of radius. Operation.* L. B. of Auburn, æt. 38, broke the radius and ulna of the left arm at the upper end of the lower third. Dr. Richards, of Cayuga Co., dressed the fracture. Two years after (1835) I found the ulna united, shortened, but the radius was not united. He had no power of supination or pronation.

I exposed the broken ends of the radius, and removed a piece from each fragment with a saw. I then closed the wound completely and applied a splint. In four weeks from this time the bone had united and was firm.

The patient subsequently commenced an action against Dr. R. for damages, but it never came to trial.

CASE. The following interesting case has been furnished at my request by Dr. Winne, one of the surgeons of the Buffalo Hospital of the Sisters of Charity. Dr. Winne has also kindly sent me a cast taken from the arm before the operation was made. The fracture, as shown by the cast, was at the upper end of the lower third, and it appears to have been transverse, and at corresponding points in the two bones.

I do not feel at liberty to introduce the case among my tables, since it never came directly under my own observation, and in admitting, it therefore, I should be obliged to deviate from a rule which I have established from the beginning, and which I regard as of much importance in determining the value of these tables.

BUFFALO, March 31, 1856.

DR. F. H. HAMILTON—

MY DEAR SIR: I take the earliest opportunity to comply with your kind request to submit to your inspection the cast of the forearm of Henry Manger, and also to furnish you with the notes of

the case taken by Dr. Ellory P. Smith at the time of the operation and subsequently.

I can only add that at the time of leaving the hospital, he had acquired much control over the flexor and extensor muscles, and was rapidly improving some weeks after his dismissal.

Respectfully yours,

CHARLES WINNE.

Notes of a case of angular deformity of the left forearm.

"Henry Manger, æt. 28, was admitted into the Hospital of the Sisters of Charity June 24th, 1854, for the removal of a distortion of the left forearm, both bones of which had been transversely fractured February 25, 1854. The radius formed the acute angle. On June 29th, Dr. Winne commenced the operation by an incision upon the most prominent portion of the radius, and having carefully denuded the bone of its investing muscles, he removed a ∇ shaped portion by means of the saw and cutting forceps. This accomplished, the ulna was found in contact with the radius, and a small and similarly shaped piece of bone was removed from it; the arm was then made straight, wound dressed with sutures and adhesive plaster, and was laid in a well-padded wire splint, and the man placed in bed. ℞. Tr. opii ♏ xl.

June 30th. No fever, pulse 85, tongue clean.

July 1st. Slight swelling, pulse 95, tongue white.

Wound discharges small quantity of reddish serum, and has an erysipelatous look.

℞. Lotio nit. plumb. Elevate arm; plasters and rollers removed.

2*d.* Great tension of whole arm; high fever; removed stitches from wound, and applied a yeast and Peruvian bark poultice. ℞. Pil. opii gr. ij.

3*d.* Better; fever abating; odors less offensive.

4*th.* Erysipelatous appearance has declined in a measure; fever abating; has had retention of urine from effects of opium, which the house student injudiciously attempted to relieve by trying to pass a catheter, in which he failed; patient was entirely relieved by warm fomentations, and a large warm and slightly stimulating enema.

6*th.* Wound granulating; poultice discontinued, and a weak solution of nitr. plumb. applied."

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	RESULT. United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
UPPER THIRD.											
1	16 y.		M.		Simple		U.				P.
MIDDLE THIRD.											
2	25 y.	25 y.	M.		Simple		U.				P.
3	11 y.	5 w.	M.		Simple		U.	5 w.		Ensheathing callus.	P.
4	11 y.	11 y.	M.		Simple		U.				P.
5	10 y.	30 y.	M.	R.	Simple		U.				P.
6	9 y.	10 y.	F.		Simple		U.				P.
7	2 y.	2 m.	M.	R.	Simple		U.				P.
8	16 y.	3 y.	M.	R.	Simple		U.				P.
9	26 y.	7 y.	M.	L.	Simple	2 broad splints, felt, &c.	U. & D. U.	2 & 4 m.		Ulna united in 8 weeks, and the radius in 16.	P.
10		40 y.	M.		Simple		U.				Imp.
11	30 y.	4 m.	M.	R.	Simple	2 broad splints, paste, &c.	U. & D. U.	7 w.		Ulna united in 7 weeks, but radius had not in 4 months.	Imp.
12		4 m.	M.	L.	Simple	Carved splints.	U. & D. U.		⅝ in.	Lower fragment bent to ulnar side; 4 months after fracture, ulna not united.	Imp.
13	9 y.	2 m.	M.	R.	Simple	2 broad splints.	N. U.			Arm sloughed off.	Imp.
14	23 y.	6 m.	F.	L.	Compound		D. U.	4 m.		Union delayed 4 months; arm still swollen, &c.	Imp.
15	35 y.	2 m.	M.		Comminuted	2 broad splints, &c.	U.		¼ in.	Slight deformity.	Imp.
LOWER THIRD.											
16	3 y.	7 y.	M.		Partial	No splints.	U.				P.
17	18 m.	1 y.	F.	R.	Partial	Splints, &c., for 3 or 4 days.	U.				P.
18	5 y.		M.	L.	Partial	Single splint.	U.			Fragments were at first salient backwards.	P.
19	6 y.	4 w.	F.	R.	Partial	Single splint.	U.			Salient backwards; probably at epiphysis.	P.
20	8 y.	2 m.	M.	L.	Partial and complete	Single splint.	U.	21 d.		Salient forwards.	P.
21	2 y.	4 m.	M.		Partial and complete	No splints.	U.			Ulna broken 1 inch from its lower end, and radius bent at junction of epiphysis with diaphysis.	P.
22	14 y.		M.		Partial and complete	2 broad splints.	U.			Radius broken, and ulna bent.	P.
23	11 y.	14 y.	M.	R.	Simple		U.				P.
24	8 y.	1 y.	M.	R.	Simple	Paste bandage.	U.				P.
25	12 y.	6 y.	M.		Simple		U.				P.
26	7 y.	3 m.	M.		Simple	Two splints.	U.			Probably at junction of epiphysis with diaphysis, and perhaps not complete; fragments bent forwards.	P.
27	10 y.	18 y.	M.		Simple	Splints.	U.			Deformity remaining 4 years.	P.
28	14 y.	3 m.	M.		Simple	Splints after four weeks.	U.			Deformed as in fracture of radius.	Imp.
29	10 y.	13 y.	M.		Simple		U.				P.
30	30 y.	6 w.	F.		Simple	1 straight splint after 2d week.	U.				P.
31	23 y.	6 w.	M.		Complicated with fracture of humerus	Gutta percha and wooden splints.	U.				P.
32	9 y.	1 y.	M.		Simple	Refractured after two weeks and splints applied.	U.				P.
33	16 y.	10 y.	M.	R.	Simple	Two wide splints.	U.			Ulna projects.	P.
34	12 y.	1 y.	F.	R.	Compound	Three splints.	U.				P.

LOWER THIRD—*Continued.*								RESULT.				
No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	TREATMENT.	United or not.	When united.	Amount of shortening.	Remarks.	Perfect or Imperfect.
35	32 y.	8 m.	M.	R.	Simple		U.			It was accidentally re-fractured at end of about 4 months.	P.
36	10 y.	3 m.	M.	R.	Compound	One gutta percha splint.	U.				Imp.
37	18 y.	14 y.	M.	L.	Compli-cated		U.		¼ in.		Imp.
38	36 y.	7 w.	M.		Compound commi-nuted	Gutta percha, &c.	U.			Lower fragments inclined to ulnar side.	Imp.
39	35 y.	3 y.	M.	R.	Compound	2 broad splints.	U. & D. U.			Ulna united soon, but the radius not until the 9th week; arm inclined to ulnar side from seat of fracture downwards.	Imp.
40	38 y.	2 y.	M.	L.	Compound		U. & N. U.			Ulna united in usual time, but radius delayed two years; operation, prosecution, &c.	Imp.

REMARKS.

Of forty fractures of the radius and ulna, one occurred through the upper third, fourteen through the middle, and twenty-five through the lower.[1] In three instances the fracture was probably at the junction of the epiphysis with the diaphysis.[2] Thirty-three of these patients were males, and seven females. Fourteen are known to have occurred in the right arm, and seven in the left.

Thirty-three were simple, of which number four were partial fractures of both bones, two were partial fractures of the ulna, with, in each instance, complete fractures of the radius, and one was a partial fracture of the radius with complete fracture of the ulna.

All of the partial fractures belonged to the lower third, and occurred in children whose ages ranged from eighteen months to fourteen years. The frequent occurrence of partial fractures in the bones of the forearm has been noticed by many surgical writers, but the remarks of Nélaton, Malgaigne and others, that they occur more often in these bones than in any other, is not sustained by my experience. Thus of fifty-three fractures of the clavicle fourteen were incomplete; while of forty fractures of the radius and ulna, broken conjointly, or of one hundred fractures of these bones both

[1] "Occurs most commonly in the *middle!*" Chelius, vol. i. p. 612.

[2] See Robert Smith, op. cit. p. 164, on "Separation of the inferior epiphysis of the radius, with fracture of the lower extremity of the ulna."

jointly and separately, only seven were partial; or to speak more precisely, and regarding each fracture of both bones of the forearm as two fractures, of one hundred and twenty fractures, only eleven were incomplete.

Five fractures were compound, one comminuted, one both compound and comminuted, one complicated with a fracture of the humerus, and one with a partial luxation of the lower end of the radius. With one exception, all of these more serious accidents are arranged among the fractures of the lower third.

In thirty-six cases bony union has been accomplished in the usual time. In Case 9 the ulna united in eight weeks, and the radius in sixteen. In Case 11 the ulna had united in seven weeks, and the radius remained disunited at four months. In Case 12 the radius was firmly united, when I examined the arm, four months after the accident, but the ulna was slightly movable. In case 14 union was delayed in both bones nearly four months. In Case 39 the ulna united in the usual time, but the radius not until the ninth week. In Case 40 the ulna also united in the usual time, but the radius was ununited after two years, and union was only then effected by an operation.

Thus, in four cases the ulna united promptly, but the radius delayed, in one case the radius united and the ulna delayed, and in one case the delay occurred in both bones.

Twenty-eight have resulted in a perfect restoration, eleven in an imperfect restoration, and one in a loss of the arm.

The prognosis in these accidents seems to take the widest range, for while a larger proportion than in the case of almost any other long bones united without appreciable deformity, a considerable proportion delay to unite or do not unite at all, and some, even where the fracture is most simple, result in the complete loss of the limb by gangrene.

Of the occurrence of gangrene, and the consequent loss of the entire arm after a simple fracture, I have reported one example. A second example has occurred in the practice of Dr. Snell, a very respectable young physician of Brooklyn, N. Y., in which "a fracture of the humerus, involving the elbow-joint, occurring in a boy of slender stamina, resulted in the loss of a part of the hand by mortification, the little finger perishing from dry gangrene, and the adjacent parts afterwards sloughing by ordinary humid mortification." A prosecution ensued, in which Drs. Willard Parker and Prince declared their conviction that "these untoward consequences

were due to the bandages having been applied too tightly;" while Drs. Valentine Mott, David L. Rogers, James R. Wood, Daniel Ayers, Edward H. Dixon, and others, believed "that the mortification of the fingers resulted from causes over which he had no control."[1] The jury returned a verdict against the Dr. for $3,000. It is understood, however, that a new trial will be granted, as the verdict was clearly against the weight of testimony.

Dupuytren[2] reports two cases of fracture which resulted in gangrene. In the first case the radius was broken near the wrist, in a man forty-four years old. "An apparatus was applied but fastened too tightly, and notwithstanding the great swelling and acute pain it was not removed until the fourth day." The forearm was then "red, painful, and covered with vesications," &c. Amputation was performed above the elbow about six weeks after the accident, and the patient recovered. In the second case the radius was broken near its middle by a direct blow, in a man thirty-six years old. The fracture was simple. The surgeon applied the usual apparatus, consisting of pads, splints, &c., confined by a roller, which was applied so tightly as to give rise to very great suffering. Notwithstanding this the surgeon did not loosen the dressings, and on the fourth day, when he came to Hôtel Dieu, the hand and fingers were dead. Amputation was performed on the twelfth day at the elbow-joint, but the patient died on the twenty-second day after the accident. Dupuytren also mentions a case which had been observed by M. Thiery, where an apparatus had been applied to a supposed fracture of the radius in a young girl. After suffering excruciating torment, the forearm mortified, and amputation was the only resource; on examining the limb no trace of fracture could be discovered.

Robert Smith reports also the case of a boy, æt. 18, who had a fracture of the lower extremity of the radius through the line of the epiphysis, caused by being thrown from a horse. A surgeon applied, within an hour, a narrow roller, tightly around the wrist. On the following day the limb was intensely painful, cold, and discolored. The roller was not removed nor slackened. On the fourth day he was admitted into Richmond Hospital, when the gangrene had reached the forearm. Spontaneous separation finally occurred about two inches below the elbow, and the bones being sawn asunder, the boy recovered.[3]

[1] Amer. Med. Gazette, Jan. 1856.

[2] On the Injuries and Dis. of Bones. London ed., pp. 145–6.

[3] Op. cit., p. 170.

Dr. Smith says, similar cases have been recorded in the *Gazette Médicale.*

Malgaigne remarks, "when the displacement is considerable, or more especially when the outward violence has been excessive, we frequently see follow a very intense inflammatory swelling, and there is no fracture which complicates itself so easily with gangrene under the pressure of apparatus."[1]

Says Nélaton: "If we make choice of the apparatus of J. L. Petit, it is necessary that it should not be applied too tightly, for, as Professor Roux has long since remarked, fractures of the forearm are those which furnish the most of the examples of gangrene, in consequence of an arrest of the circulation. This is easily understood, if we consider on the one hand the superficial position of the two principal arteries of the forearm, and on the other hand the disposition of the appareil, which must almost infallibly compress the arteries to a great extent."[2]

The cases recorded are not numerous: including the two mentioned by myself, I have no certain accounts of more than six; yet this is sufficient to warrant a serious apprehension of so grave a result.

I do not think this accident is the necessary result of any peculiar form of treatment, nor that it is always due to the negligence of the surgeon. It certainly was not in the case of the lad whom I saw, and I can easily suppose that in a majority of cases, it was due rather to the carelessness of the patient than of the surgeon. In some measure, doubtless, it may be due also to the severity of the injury and to the general condition of the patient. A number of unfortunate circumstances may have concurred, and the inflammation and swelling may have been developed with a rapidity which no one could have anticipated. Yet, that it may be the result of maltreatment on the part of the surgeon, is undeniable. It is proper, however, to descriminate between the responsibility which attaches to the surgeon as the true exponent of the state of his art, and that which attaches to the art itself as taught by the masters.

The old surgeons applied first a roller to the hand and forearm, and over this their various splints. J. L. Petit thought he had made a valuable improvement upon this simple plan in laying *over* the roller a compress, supported by a splint, designed to press between the bones, and to antagonize thus the action of the roller

[1] Op. cit., p. 589.

[2] Op. cit., p. 737.

in drawing the fragments towards each other. Duverney believed that this object would be best accomplished by placing the pad against the skin, and *under* a circular compress; while Desault declares all of these modes inefficient, and announces a method which he regards as accomplishing at once and completely all of the indications; the sole peculiarity of which method consists in placing the graduated pads against the skin, and securing them in place by a roller.[1] Boyer[2] adopts the same method without any modifications, and Mr. Hind, in his illustrations of fractures already referred to, has seen fit to recommend the same, at least in fractures of the radius.

It is quite obvious that between these various methods there remains very little if anything to choose, the differences being too trifling and unessential to claim serious consideration. Each alike is inadequate to accomplish any amount of useful pressure between the fragments; each alike is calculated to bind the bones against each other, and each alike exposes to the danger of ligation and of gangrene.

Says M. Dupuytren, "The practice of rolling the arm before the splints are applied, whether internal or external to the pads and compresses, is eminently mischievous; and instead of fulfilling, directly counteracts, the indication which it is most important to keep in view, in the treatment of fractures of the forearm."[3]

And notwithstanding the same sentiment has been reiterated by Velpeau, Malgaigne, Nélaton, Samuel Cooper, Bransby Cooper, Erichsen, Amesbury, Gibson and others, yet we find to-day the great surgeon of Heidelburg, Mr. Chelius, recommending the roller to be applied under the splints, after the manner of Desault: while Mr. Liston, Mr. Syme and Mr. Fergusson, who perhaps represent the Edinburgh School, use only pasteboard splints, above the compresses, over which are immediately applied the roller; a practice which differs very little from that recommended by Desault, and is equally obnoxious to criticism.

Among the American surgeons I believe, the advice and practice of Dupuytren has received almost universal assent, only that we have always employed splints much wider than those recommended by this distinguished surgeon. I cannot therefore agree with my accomplished countryman, Dr. Reynell Coates, if in the following

[1] "Treatise on Fractures and Luxations," by P. J. Desault, Amer. ed., p. 156, 1805.
[2] Lectures of Boyer on the Bones, Amer. ed., 1805, p. 86.
[3] Op. cit., p. 147.

paragraph he means to imply that American surgeons generally adopt Desault's treatment. Such at least is not my experience. "It would be wrong," says Dr. Coates, "not to bear testimony, on every possible occasion, against the folly so universally prevalent, that induces surgeons to apply a bandage directly to the forearm before applying splints in injuries of this character. We have often asked for a rational explanation of this practice, without effect. It is directly at war with the acknowledged indications in the coaptation of the fragments, and when the object of the whole apparatus is to thrust asunder their extremities, it commences by binding them together. Few plans in surgery are more generally followed; none can be more absurd."[1]

Of the estimate placed upon the roller by M. Mayor, the reader will judge by a reference to the passage which I shall quote further on, when I shall speak of the value of the interosseous compresses.

Amesbury and Bransby Cooper use no rollers at all—not even to secure the splints in place, the splints being made fast to the forearm by straps or tapes; a practice which, I am happy to say, has found hitherto, except perhaps among the English, very few followers.

Mr. Amesbury and Mr. South also endeavor to give to their splints an appropriate shape, by having them constructed with more or less convexity. It must be noticed, however, that the practice of these two gentlemen is very dissimilar, for while Mr. South applies the convex surface of his splint to the interosseous space, Mr. Amesbury reverses this plan, and applies the concave surface directly to the skin.

As to the width of the splints, surgeons are also very generally agreed, at the present day, that they ought to be at least wider than the arm, so as to prevent the roller or the tapes from resting against the sides of the arm.

I do not intend to deny peremptorily, and without qualification, the value of the graduated compresses, which, as we have seen, are usually laid along the interosseous spaces, to press the fragments asunder. It is necessary, however, to caution the surgeon against their injudicious use. M. Nélaton has well remarked of the appareil employed by J. L. Petit, that it must inevitably compress, to a great extent, the arteries of the forearm; and the remark is applicable, in only a less degree, to all of those other plans in which

[1] Amer. Jour. of Med. Sci., vol. xvii. p. 147, 1835.

the compress is employed. And I suspect that to this portion of the dressing, quite as much as to any other cause, is due those frightful accidents of which we have already spoken. The arteries are not only exposed, from their superficial position, to pressure from a compress, but, in addition to this, it will be noticed that the two principal arteries, the radial and the ulnar, are situated upon a broad, flat surface of bone, along which this pressure must operate most disadvantageously. So early as the year 1833, M. Lenoir, in his inaugural thesis, at Paris (p. 19), called attention to this danger, and from time to time surgeons have continued to advert to it, but they have seldom given to its consideration that prominence which its importance deserves.

I have observed another fact in this connection. When this compress is extended low down on the palmar surface, within an inch or two of the wrist-joint, it soon becomes excessively painful, and sometimes even wholly insupportable, in consequence of the pressure made upon the median nerve; and I find myself always obliged to exercise great care in the adaptation of the pads at this point. For this reason alone, I believe that in case of a fracture near the base of the radius, the lower fragment, if it were thrown towards the ulna, could not be retained in its place by graduated compresses.

In short, finding that broad splints, properly covered and padded, answer very well to crowd the muscles into the interosseous space, so far as it is proper to do so, and believing that this mode is less painful and less dangerous, I seldom resort to graduated compresses, nor can I appreciate their necessity, nor, indeed, their utility. Mr. Lonsdale also concurs with me in attaching very little value to this part of the customary appareil. But listen to the surgeon of Lausanne, M. Mayor: "Que signifient les compresses graduées entre les os de l'avant-bras afin de les tenir écartés l'un de l'autre? Ils n'auront pas la tendance qu'on leur suppose, a se rapprocher sans cesse, pouru, 1°, qu'ils soient bien réduits; 2°, que pour les maintenir en position, on ne fasse par usage de liens circulaire préables, et dont l'action est un vrai contre-sens; et enfin 3°, qu'on fasse agir les moyens contentifs essentiellement sur les regions palmaire et dorsale de l'avant-bras."[1] M. Mayor proceeds to declare these convictions to be the result of his own experience, both in the treatment of

[1] Bandages et appareils a pansements, ou nouveau systeme de delegation chirurgicale, par M. Mathias Mayor, chirurg. en chef de l'hospital de Lausanne, Switserland, p. 346, Paris ed., 1838.

single and compound fractures of the forearm, and he is almost tempted to think that they were merely invented to remedy an evil which a roller under the splint was intended to produce; since, by dispensing with the roller, the indication for the use of the compresses does not exist. He further remarks: "Quoi qu'il en soit, le temps a consecré ce moyen, et on sait assez ce que sont les habitudes, leur ténacité, et le respect, qu'elles inspirent quand elles ont la vénérable sanction du temps, j'allais presque dire de l'aveugle routine."

Surgeons have generally, of late years, after the splints have been applied, placed the forearm in a position of semi-pronation, or midway between supination and pronation, so that the radius should be uppermost; it being assumed that in this position the two bones were most nearly parallel, and least inclined to displacement. Such, indeed, was the practice of Hippocrates, Paulus Ægineta, Celsus, Albucasis, and of most of the early surgeons; but R. Smith, Lonsdale, South, and Nélaton have called in question the correctness of this mode of dressing, at least as a universal practice.

I have before mentioned, when speaking of fractures of the ulna, that M. Fleury had, in one instance, been unable to bring the fragments into apposition, except by forced supination of the forearm, and in certain fractures of the radius the same position has been spoken of by Lonsdale, as being especially demanded.

Says Mr. South: "In fractures of both bones the forearm is best laid supine,"[1] while M. Nélaton declares that in fractures of the upper third it will be indispensable to supine the arm, both during the reduction and subsequent treatment; but that in fractures of the two inferior thirds we may place the limb in a condition of semi-pronation.[2]

It seems very probable, however, that both of these gentlemen have received their suggestions from Mr. Lonsdale,[3] who has considered the question very much at length, and who has finally declared his decided preference for the supine position in the treatment of all fractures of the forearm. His arguments are very ingenious, and as applied to fractures of the radius above the insertion of the pronator radii teres, conclusive; and indeed they commend themselves very strongly to our judgment as applied to

[1] Chelius's Surgery, note p. 613.

[2] Op. cit., p. 734.

[3] Treatise on Fractures, by Edward F. Lonsdale, London ed., 1838, pp. 123–138.

all fractures of the forearm. They are sustained also by the results of his own experience, and I see no good reasons why they should not be more thoroughly examined and tested by other surgeons. The advantages which he claims for this method are more perfect coaptation of the fragments, less liability of the fragments to encroach upon the interosseous space, and consequently less danger of anchylosis between the bones, and of non-union of the fragments, more complete restoration of the power of supination, less tendency to lateral distortion, or of a falling off to the ulnar side, and facility of application.

My own cases treated by the usual method have shown that while supination is frequently impaired, and sometimes entirely lost, pronation is rarely affected; and that the danger of an inward (ulnar) inclination of the bones, a result probably of the weight of the hand acting upon the lower fragments as it lies suspended over the sling, is not inconsiderable. Hippocrates alludes to this latter accident, and there are three specimens in the Dupuytren Museum at Paris which furnish extreme illustrations of it; the angles varying from 135° to 150°.

Mr. Lonsdale ascribes the loss of the power of supination, which, as has been observed, occurs so frequently after these fractures, not so much to the formation of a bony union between the two bones, the radius and ulna, as to the malposition of the lower fragment in its relation to the upper; an opinion which he makes to appear very probable, and which obtains additional confirmation from my own experience, since I have not recognized this bony union in a single instance of the very many described as having lost in some degree the power of supination.

If this plan is adopted, viz: laying the hand and forearm upon its back, instead of upon its ulnar margin, the elbow should remain at the side, the humerus falling perpendicularly from its socket; and the forearm should rest in the sling directed forwards from the body. But finally, whatever may be the mode of dressing, let me repeat the injunction to examine the arm frequently. No surgeon can do justice to himself or to his patient who does not look at the arm at least once in twenty-four hours during the first fortnight, and in some cases the patient ought to be seen twice daily.

When the fracture is compound, it is sometimes impossible to retain the forearm in the half-proned position; since, when placed in this position, and only slightly supported, as it must almost necessarily be, it inevitably falls over upon its palmar surface.

There can be no doubt in such a case that from the first we ought to place it upon its back in the position of complete or nearly complete supination; and in a condition also of perfect rest. For this purpose a single broad splint carefully cushioned and covered with silk oil-cloth, is the most suitable. Upon this the forearm is to be laid, and only very gently bound with rollers. If the patient is able, and wishes to walk about, the board may be suspended to the neck, as recommended by M. Mayor.

CHAPTER XI.

CARPUS.

THE few cases of fracture of the carpal bones which have come under my observation were, without exception, compound and complicated, and have resulted in the complete loss of the hand, or in some less serious, but never inconsiderable mutilation or maiming.

In no case has a treatment been adopted which might be regarded as having reference to the fracture, or the purpose of which was to insure apposition and union of the fragments.

It may be proper, however, in a matter so easily comprehended, to assume what one's personal experience has not actually proven, namely, that simple fractures of these bones will unite generally without much displacement, and without any very perceptible maiming. It is indeed quite probable that some degree of anchylosis between their adjacent surfaces would occur, yet even in the normal condition they enjoy so little motion as to render it doubtful whether its complete loss would be very sensibly felt.

In cases of compound and complicated fractures of the carpal bones, which accidents are sufficiently common, the surgeon has only, I conceive, to follow carefully those general or special indications which may happen to be present, the precise character of which it would be difficult to anticipate, and for the treatment of which it would be unsafe to attempt here to provide.

CHAPTER XII.

METACARPUS.

CASE 1. *Simple fracture. Result perfect.*

Miss E., of Erie Co., N. Y., about 18 years old, fell Aug. 7, 1853, striking upon her right hand, with her fingers forcibly flexed.

I examined the hand Aug. 8, the day following the accident, and found the metacarpal bone of the ring finger of the right hand broken about three-quarters of an inch from its lower or distal end. The distal end of the lower fragment was depressed, and a slight swelling existed over the seat of fracture. A feeble crepitus could be occasionally detected.

I applied a firm pad against the palmar surface of the metacarpo-phalangeal articulation, and secured it in place with a palmar splint.

One month later, it was united, with only slight deformity.

CASE 2. *Simple fracture. Result perfect.*

Webb Spencer, of Buffalo, æt. 29, broke the metacarpal bone of the little finger of his right hand by striking with his clenched fist May 14, 1854. The fracture is about one inch from its lower end.

He called upon me two weeks after it had occurred. The fragments were not then united. The lower end of the distal fragment was depressed towards the palm of the hand.

I applied a splint with compresses, &c. In two weeks it was united and without displacement.

CASE 3. *Simple fracture. Result perfect.*

Michael Haamond, of Buffalo, about 30 years old, broke the metacarpal bone of the thumb of the left hand through its upper third, May 10th, 1852. Simple fracture. I dressed it with a carefully moulded gutta percha splint. In less than a month the finger was well and straight.

CASE 4. *Simple fracture. Union with displacement.*

Thomas Rose, of Buffalo, æt. 8, fell down stairs Sept. 11, 1855, breaking the metacarpal bone of the index finger of the right

hand, half an inch from its lower end. It was probably a separation at the epiphysis. The lower fragment projected into the palm of the hand.

I saw the lad about sixteen hours after the occurrence. I could easily replace the fragments, but they would not remain in place. There was no crepitus. I examined and dressed it very carefully, but after two months I find it still displaced.

CASE 5. *Simple fracture. Union not perfect.*

William Pimlott, æt. 27, broke one of the metacarpal bones, of the right hand, at the junction of the lower epiphysis with the diaphysis, by striking another man with his clenched fist. It was dressed by an apothecary in Ireland. Fourteen years after, I found the bone displaced backwards at the seat of fracture.

CASE 6. *Compound fracture. Result perfect.*

Harvy Herse, of Buffalo, æt. 21, cut, Sept. 6, 1851, the metacarpal bone of the index finger, through its lower third. It was cut obliquely and nearly through its entire diameter, but not quite, the separation being completed by breaking.

I tied a digital artery and applied splints. The result, after one month, was a perfect finger.

CASE 7. *Simple fracture. Result imperfect.*

T. B. of Buffalo, æt. 19, broke the metacarpal bone of the ring finger of the right hand in March 1854, by striking upon a board with his clenched fist. Fracture one inch from its lower end.

I saw it one month, and again two years after it had been broken. The fragments were then firm. Indeed it seems to have been bent rather than broken. A manifest displacement still continued; the lower end of the distal fragment being depressed toward the palm of the hand. The bone also remained quite tender at the seat of fracture.

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character of the fracture.	Which bone.	Points of fracture.	TREATMENT.	RESULT.			
									United or not.	When united.	Remarks.	Perfect or imperfect.
1	18 y.	1 m.	F.	R.	Simple	5th	Lower third	Pad and splint.	U.	4 w.		Imp.
2	29 y.	4 w.	M.	R.	Simple	5th	Lower third	Pad and splints.	U.	4 w.		P.
3	30 y.	1 m.	M.	L.	Simple	1	Upper third	Gutta percha splints, &c.	U.			P.
4	8 y.	2 m.	M.	R.	Simple	2	Lower third epiph.	Gutta percha splints, &c.	U.		Could not keep fragment in place.	Imp.
5	27 y.	14 y.	M.	R.	Simple	5th	Lower third epiph.		U.			Imp.
6	21 y.	1 m.	M.		Compound	2	Lower third	Splints, &c.	U.			P.
7	19 y.	2 y.	M.	R.	Simple	5th	Lower third		U.		Remains bent towards palm; still tender at seat of fracture.	Imp.

REMARKS.

Of seven fractures of the metacarpal bones, one occurred in the first (metacarpal bone of the thumb), two in the second, and four in the fifth. Six occurred in the lower third, and one in the upper third. All except one were simple fractures.[1] Case 5 was a separation of the lower epiphysis, and confirmed the observations made by other writers, that such accidents are with difficulty distinguished from dislocations. Case 7 was a partial fracture.

In cases 1, 2, 5, and 7, the fractures were produced by blows upon the knuckles with the clenched fist, and in each instance the fracture was through some part of the lower third of the fifth metacarpal bone of the right hand.

The greater frequency of a fracture of the fifth bone has been noticed by both Chelius and Nélaton.

Dorsey, in his *Elements of Surgery*, mentions also that he has known the metacarpal bones to be fractured in pugilistic contests.

Of the whole number, three are now perfect and four imperfect. The displacement in every instance was the same; the lower end of the lower fragment being thrown towards the palm of the hand: a direction which is due probably, in all cases where the fracture is the result of a counter stroke, to the natural curve of the bones and to the direction of the force, and not, as Mr. B. Cooper has suggested, solely to the action of the interossei.

[1] See remarks on fractures of phalanges.

The treatment which I have myself adopted has been very simple. I have endeavored, first, by force to restore the fragments to line, and then by compresses and moulded splints, I have sought to keep them in place.

My experience teaches me, however, not to be too sanguine of success. If the fractures had occurred in either the third or fourth metacarpal bones, both of which are less accessible than the first, second, or fifth, I should have anticipated some difficulty in restoring the fragments to place, and in keeping them there, but I confess I was not prepared for the embarrassments which have hindered my success in Cases 1 and 4; in the latter of which—a separation of the lower epiphysis—I had every opportunity which could possibly be afforded, and yet I was unable to retain the fragments in any degree of proper apposition.

The precise source of the difficulty in this case as well as in Case 1, I am not prepared to explain; but I suspect it may be found in the proximity of these fractures to the joint, and in the advantageous action of the flexor muscles operating both upon the lower end of the fragment, and upon the adjacent phalanges.

CHAPTER XIII.

PHALANGES.

CASE 1. *Simple fracture. Result perfect.*

A German lad, about twelve years old, had his fingers crushed, so that I was obliged to amputate the first finger. The second finger was also broken at the distal end of the first phalanx. I believe it was a separation of the epiphysis. Crepitus and motion between the fragments were distinct, but there was no displacement.

I treated this fracture or separation without splints. Union occurred in a few days, and without deformity.

CASE 2. *Simple fracture. Result perfect.*

Michael R., of Buffalo, æt. 36 years, broke the first phalanx of his thumb, Dec. 1, 1854. Simple fracture.

I applied a gutta percha splint. The fragments united in about three weeks, and without any perceptible ensheathing callus, and without deformity.

CASE 3. *Simple fracture. Result perfect.*

Joseph Chiynier, æt. 4, admitted to Hospital Dec. 24, 1849, with a simple fracture of the first phalanx of the ring finger of the left hand. Fracture at the junction of the epiphysis with the shaft, at the proximal end of the bone.

The finger was so much swollen that we applied, at first, only simple dressings.

On the fifth or sixth day a gutta percha splint was moulded to the finger. It resulted in a perfect cure.

CASE 4. *Simple fracture of the index finger, resulting in amputation.*

Stephen Clifford, of Buffalo, æt. 25, broke the index finger of his right hand on the 1st of Aug. 1848, and was admitted to the Hospital on the 5th of September. Deep seated inflammation had followed the injury, which had been succeeded also by suppuration and sloughing of the skin, tendons, &c. I immediately amputated the finger at the metacarpo-phalangeal articulation.

CASE 5. *Compound fracture. Result imperfect.*

John Thompson, of Buffalo, æt. 7, broke the two phalanges of the thumb through their adjacent articular surfaces, Oct. 28, 1851. The fracture was compound. I dressed the thumb carefully, with a pasteboard splint.

Union of the fragments was very tardy, and notwithstanding my utmost care, it united with a slight deformity, and with anchylosis at this joint.

CASE 6. *Compound fracture. Union with slight deformity.*

Emeline Knapp, of Auburn, N. Y., æt. 6. Her hand was caught by a door thrown violently shut, breaking one of the phalanges of the little finger, and nearly severing the finger.

I closed the wound and dressed the finger with a splint, &c. The bone united rapidly, but the distal fragment turned a very little upon its axis in the splint, during the treatment, and the palmar surface was found at last presenting diagonally towards the ring finger. I dressed the finger often and was very assiduous in my attempts to make it perfect.

CASE 7. *Compound fracture. Anchylosis.*

An Irish laborer, aged about 30 years. A bar of iron fell upon the second finger of the left hand, breaking one of the phalanges and exposing the adjacent articular surface.

I dressed the wound with sutures, &c., and applied a gutta percha splint.

The bone united with slight anchylosis and without deformity.

CASES 8, 9, 10. *Compound fractures. Result perfect.*

———, of Buffalo, aged about 25 years. His hand was caught between the bumpers while coupling cars, breaking and lacerating the first, second, and third fingers.

I dressed the wounds and then supported the fingers with a single gutta percha splint.

On the twenty-first day the first finger had united, and without any perceptible ensheathing callus. On the thirtieth day the other two fingers had united also. The union was in each case unaccompanied by deformity.

CASE 11. *Compound comminuted fracture. Union with shortening.*

Robert Taylor, of Auburn, broke the second phalanx of the little finger at two points, and at the same time bruised it severely. I removed the intercepted fragment, of half an inch in length, and dressed it with a splint, &c.

It united with shortening, but with no other deformity or maiming.

CASES 12, 13, 14. *Compound comminuted fracture. Result perfect.*

Sept. 22, 1848. George W. A., of Buffalo, about 18 years old, received an injury upon his right hand from a buzz saw, laying open the joints of the first, second, and third fingers, and comminuting the bones in the two last, so that several fragments were removed immediately, and two or three came out after the fifth or sixth day.

I applied simple cold water dressings, and believing that the motions of these joints must be lost, I kept the fingers slightly bent.

The result has been a complete restoration of the functions of all the joints.

I examined the hand six months after the injury was received.

CASE 15. *Simple fracture. Result imperfect.*

An Irish laboring woman, aged about 35 years, fell down a flight of steps and broke the first phalanx of the thumb below its middle. Dr. Congar, of this city, was called, I think, on the following day, and found the fragments displaced and shortened upon each other, and by no effort which he had made could he succeed in restoring them to place. On the same day Dr. Congar requested me to see the patient with him.

The lower or distal fragment was displaced backwards, and was lying upon the dorsal surface of the proximal fragment, being overlapped apparently about one-quarter of an inch.

Together, we repeated the efforts which Dr. C. had previously made, pulling upon the thumb with a sliding noose with all the strength of our four hands, but to no purpose. The fragments could not be reduced for one moment; and we left the patient as we found her, only a little the worse for our violent and repeated extensions.

No.	Age when it occurred.	Time since it occurred.	Sex.	Right or left side.	Character.	Which finger.	Which phalanx.	Point of fracture.	TREATMENT.	RESULT.				
										United or not.	When united.	Amount of shortening.	Remarks.	Perfect or imperfect.
1	12 y.	1 m.	M.		Simple	2d	1st	Lower third epiph.	No treatment.	U.				P.
2	36 y.	3 w.	M.		Simple	Thumb	1st		Gutta percha splint.	U.	21 d.			P.
3	40 y.	1 m.	M.	L.	Simple	3d	1st	Upper third epiph.	Gutta percha splint.	U.				P.
4	25 y.		M.	R.	Com-pound	1st							Amputation on the 5th day.	Imp.
5	7 y.	1 y.	M.		Com-pound	Thumb	1st & 2d	Lower and upper third	Pasteboard splint.	U.			Anchylosis.	Imp.
6	6 y.	2 m.	F.		Com-pound	4th			Splints, &c.	U.			Lower fragment turned on its axis.	Imp.
7	30 y.		M.	L.	Com-pound	2d				U.			Slight anchylosis.	Imp.
8	25 y.		M.		Com-pound	1st			Gutta percha splint.	U.	21 d.			P.
9	25 y.		M.		Com-pound	2d			Gutta percha splint.	U.	30 d.			P.
10	25 y.		M.		Com-pound	3d			Gutta percha splint.	U.	30 d.			P.
11			M.			4th	2d			U.			Shortened half an inch, a fragment having been removed.	Imp.
12	18 y.	6 m.	M.	R.	Com-pound	1st			Cold water dressings.	U.			Motion of joints restored.	P.
13	18 y.	6 m.	M.	R.	Com-pound	2d			Cold water dressings.	U.			Motion of joints restored.	P.
14	18 y.	6 m.	M.	R.	Com-pound	3d			Cold water dressings.	U.			Motion of joints restored.	P.
15	35 y.		F.		Simple	Thumb	1st	Lower half					Could not reduce the fragments.	Imp.

REMARKS.

Of fifteen cases of fractures of the thumb and fingers, three belonged to the former and twelve to the latter. Twelve were compound and four simple. Five occurred through the first phalanx, two through the second, and the situation of the remainder is not noted. In two instances the separation has taken place at or near the junction of the epiphysis with the diaphysis. All of the fractures, except two, occurred in males.

Of the whole number, nine are perfect and six imperfect. In Case 6, the lower fragment has turned upon its own axis, so that its palmar surface presents obliquely to the adjoining finger. Several of the perfect results were from compound accidents and from accidents complicated with lesions of the articular surfaces—the form and motions of the joints having been completely restored.

I have never seen a fracture of the fingers produced by a counter-force, but in all instances the blow has been received directly upon the part broken; which circumstance, together with the smallness of these bones, and the thinness of their soft coverings, renders them peculiarly liable to comminution and laceration. The examples reported by me, however, give no correct idea of the relative frequency of these complications, since I continue to reject from my record all cases in which, from the nature and severity of the accident, no attempt has been made to unite the fragments. If fractures of other bones resulted as often in the necessity for immediate amputation as do fractures of the fingers, then would these reports determine in some measure the relative frequency of fractures in the several parts of the body; but such is not the fact, since a very large majority of fractures of the fingers are accompanied with so much laceration and contusion as to render their immediate removal necessary, if indeed a complete removal is not already accomplished.

The same remarks apply, with some qualifications, to fractures of the carpal and metacarpal bones, and to the corresponding bones in the lower extremities.

The displacement has been, with but one exception, slight, and in the direction of the diameter of the bone. In several instances there was no perceptible displacement whatever, the existence of the fracture having been only detected by the preternatural mobility and the crepitus. In Case 15, however, a fracture of the first phalanx of the thumb, a displacement in the direction of the axis of the bone took place; and notwithstanding the most persevering efforts

on the part of the attending surgeon and myself, a reduction of the fragments was not effected. This example demonstrates the remarkable power of the muscles acting upon the thumb; and since it is quite obvious that in this instance no other cause could have operated to prevent the reduction, it may possess some value in relation to the question which has been so much discussed, as to the nature and source of the resistance, in cases of dislocation of this member.

Boyer, and after him Mr. Bransby Cooper, think that when the extreme phalanx is broken, from the small size of the bone, and from its having attached to it the nail and its matrix, it is better to amputate at once, as the process of reparation is extremely slow and uncertain.

Whether in any of the cases treated by myself, or which have been particularly noticed by me, the fracture involved the last phalanx, I am not certain, but I believe that I have seen successful attempts to unite this bone when broken, and I cannot but regard the rule made by these gentlemen as much too stringent. Examples must no doubt sometimes occur in which the fracture is so simple in its character as to render its prompt restoration pretty certain; and even though the restoration prove tedious, this would scarcely be regarded as a sufficient justification for so serious a mutilation, since the loss of even an extreme phalanx is not only a deformity, but it must prove, in many occupations, a troublesome maiming.

The rule ought still to be held inviolate, which surgeons have so often repeated, in reference to injuries inflicted upon the hand and fingers, namely, that we should save always as much as possible.

It is remarkable too how much nature, assisted by art, can do towards the accomplishment of this purpose. If the bone of a finger is not only severed completely, but also all of its soft coverings, save only a tendon or a shred of integument, a reasonable chance remains for its restoration. And it is no less interesting to observe what powers of reparation are possessed by the articular surfaces of these smaller joints, so that although they be broken into, or sawn into, or comminuted, and even although small fragments be entirely removed, a complete restoration of their functions may be hoped for. I have cited some such examples. It is true, however, that such fortunate results are very rare, and that they are rather to be hoped for than to be anticipated.

In regard to treatment, it may be remarked that in recent cases, and where considerable swelling has not already supervened, the restoration of the fragments to position is, in general, easily effected; yet even here it requires often a degree of care, which one would scarcely have anticipated, to determine whether the fragments are exactly in line; and since, in the case of these delicate bones, the slightest deviation from the natural position, determines in the end an ugly deformity, it becomes exceedingly necessary, especially with females, that we should examine the fingers carefully from day to day, so that, as the swelling subsides, we may discover and correct any displacement which may happen to exist.

As a splint I have found nothing so convenient as gutta percha or felt, moulded carefully to either the dorsal or palmar aspect of the finger; and the form of which I have generally found it necessary to change slightly as often as every third or fourth day, until consolidation was nearly or quite consummated.

If the fracture is near, or extends into a joint, the finger ought to be a little flexed so as to place it in the most useful position in the event that anchylosis should occur; and as early as the end of the second week the joint surfaces should be slightly moved upon each other in order to the prevention of fibrous or bony adhesions. Nor is there much danger of preventing the union by disturbing the broken surfaces at this early day. Union occurs between these fragments very speedily, and I have never met with a case of non-union of the phalanges, nor do I remember to have seen a case reported.

It is a lateral inclination of the lower end of the finger which it will be found most difficult to obviate, and which may, perhaps, in some cases, be most successfully combated by laying the two adjoining sound fingers against the broken finger, and then applying a moulded splint to the palmar surface of the whole. In other cases it will be more convenient to apply the splint only to the broken finger.

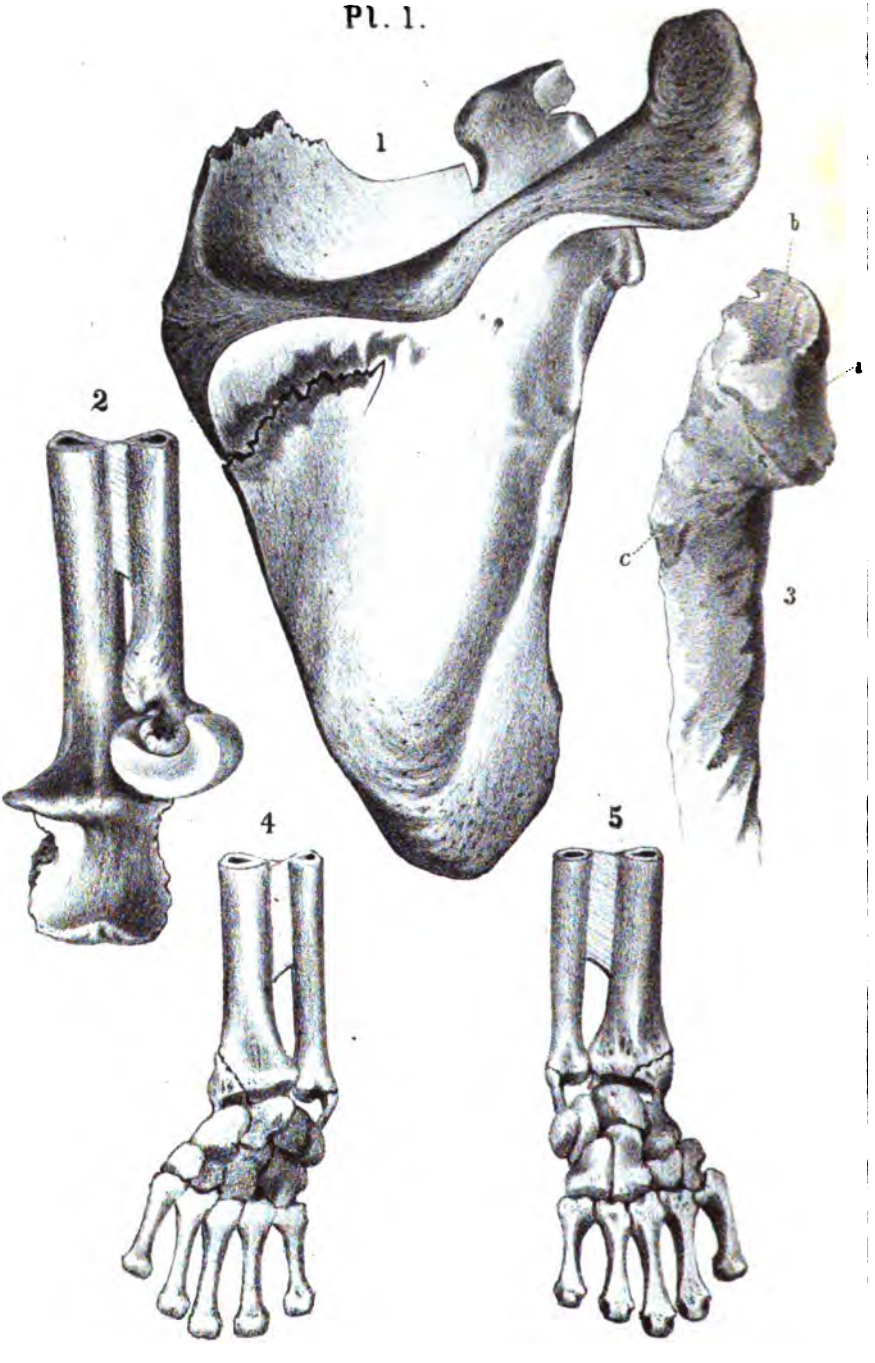
Rotation of the lower fragment on its own axis, such as occurred in Case 6, is especially to be guarded against, as the deformity which it occasions is more unseemly, and the impairment of utility more decided, than that occasioned by lateral displacement.

It may be well also to remind the surgeon of the convenience of extending the splint beyond the end of the last phalanx, and of moulding it to this extremity in order that the finger may be pro-

tected against injuries, and that when, from time to time the splint is removed, it may be reapplied with more accuracy.

In all cases the splint should be lined with cotton cloth or a piece of patent lint, and secured in place with narrow and neatly cut rollers made also of cotton cloth. Rollers of this width should never be torn, but cut carefully with scissors.

Pl. 1.



C. E. LEWIS DEL.

APPENDIX.

CONTAINING DRAWINGS OF SPECIMENS AND OF APPARATUS REFERRED TO IN THIS REPORT.

PLATE I.

FIG. 1. *Incomplete Fracture of the Scapula.* Copied from a specimen in my possession.

FIG. 2. *Separation of the Radius at its Neck.* Drawn from a specimen in the possession of Robert Watts, N. Y.

FIG. 3. *Fracture of the Radius at its Neck.* Drawn from a specimen in the possession of T. D. Mütter, of Philadelphia.

FIG. 4. *Fracture commencing on the radial side of the Radius and terminating in the Joint. Palmar surface.* Drawn from a specimen in the possession of Henry H. Smith, Philadelphia.

FIG. 5. Do. do. do. *Dorsal surface.*

PLATE II.

FIG. 1. *Welch's Shoulder Splint*,[1] adapted to the top of the shoulder and outside of the arm. The joint is required to accommodate the upper portion of the splint to the different positions of the shoulder.

FIG. 2. *Welch's Elbow Splints.* These are fitted to the two sides of the arm, and may be fixed at any degree of flexion or extension required by turning the screw, which serves also as a pivot for the hinges *a a*. The hinges may be transferred to splints of different sizes, as required.

FIG. 3. *Welch's Forearm Splint* (dorsal).

FIG. 4. *Welch's Forearm Splint* (palmar).

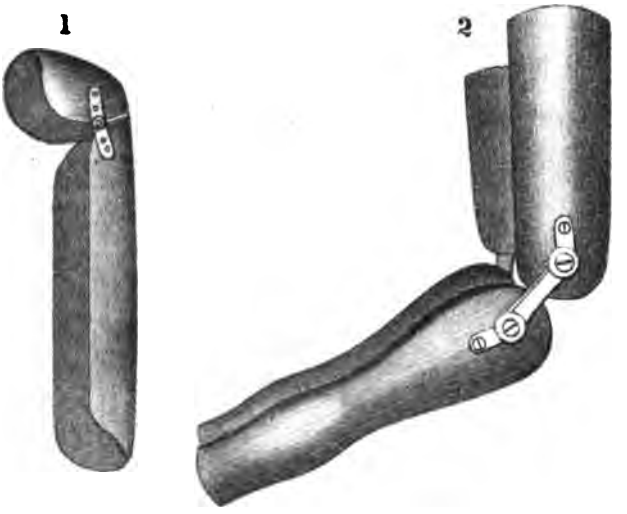
FIG. 5. *Welch's Straight Splint.*

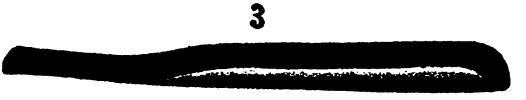
FIG. 6. *Welch's Ulnar Splint*, fitted to the ulnar side of the forearm.

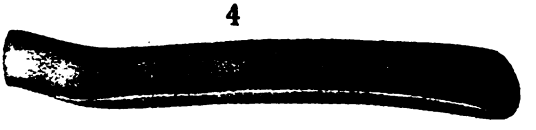
"These splints consist of light and elastic cases or coverings, formed of very thin strata or layers of wood or 'cut veneers,' cemented together by interlayers of gutta percha, of such thickness as is required to maintain their form, and pressed into the form of the part for which they are designed. By this method of constructing splints, the fibres of the wood all run longitudinally or parallel with the surface, which gives them great superiority to splints carved from solid blocks of wood, however skilfully performed and fitted to the part; for when so thin as to be elastic, they are necessarily liable to split and break, and do not retain their form when wet."

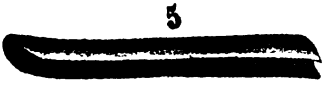
[1] Invented and manufactured by Benjamin Welch, of Lakeville (Salisbury), Conn.

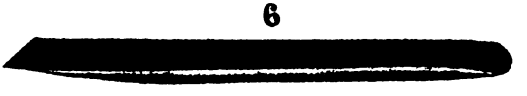
Pl. II.

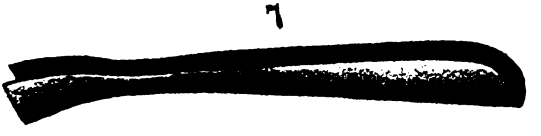












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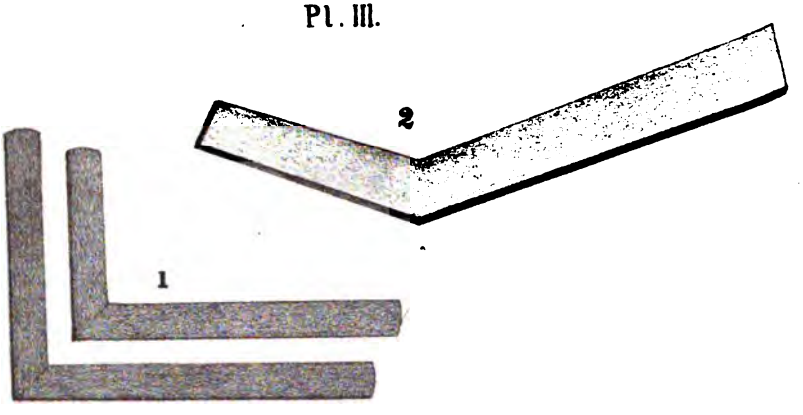
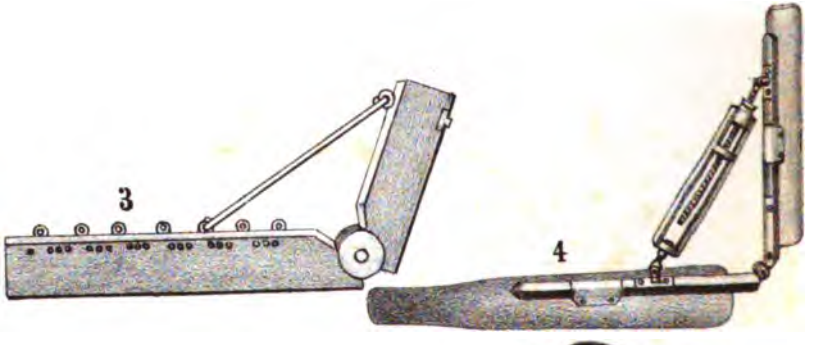
Pl. III.





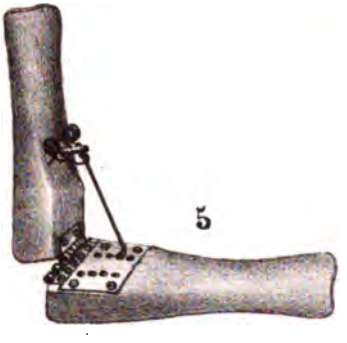


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PLATE III.

FIG. 1. *Elbow Splints, recommended by Physick.*

FIG. 2. *Physick's Splint*, designed to prevent a lateral inclination of the forearm after fractures at the elbow-joint.

FIG. 3. *Kirkbride's Elbow Splint.*

FIG. 4. *Rose's Elbow Splint* (jointed).

FIG. 5. *Day's Elbow Splint* (jointed).

FIG. 6. The author's mode of dressing, with gutta percha, in cases of fracture at or near the elbow-joint. The splint is padded throughout, and the dotted lines represent the successive turns of a roller. The sling, employed to suspend the arm, is omitted for the purpose of bringing into view more distinctly the outlines of the splint.

PLATE IV.

FIG. 1. *Bond's Splint*, for fracture of the Radius at its lower end.

FIG. 2. *Hay's Splint*, for the same fracture.

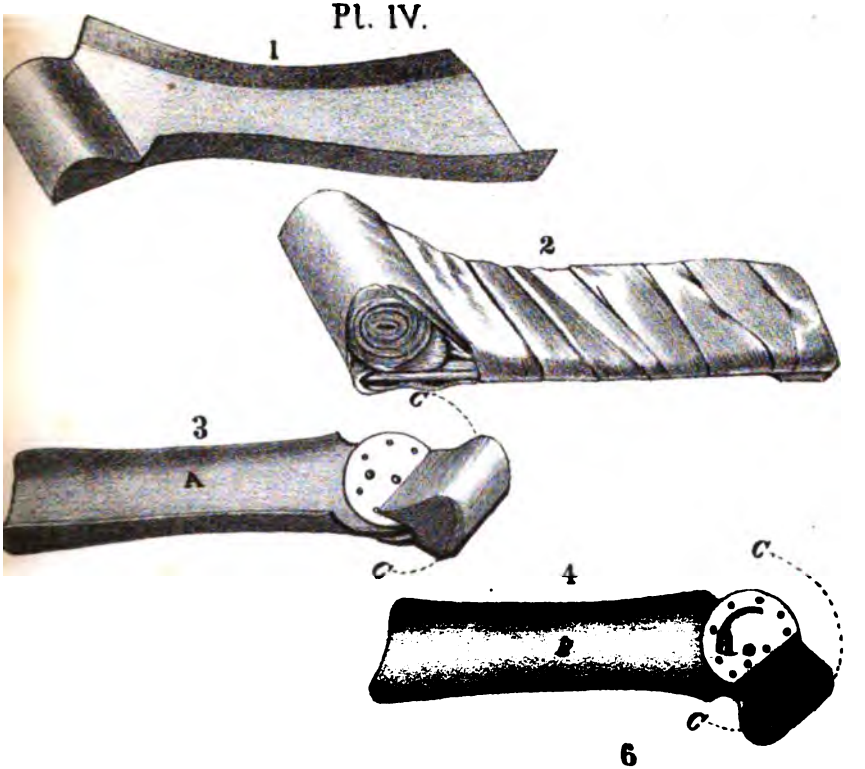
FIG. 3. *Smith's Splint*, for the same fracture (view of the palmar surface). A. Forearm splint, made of felt, with incurvated margins. B. Circular brass plate, which corresponds to one on the opposite side, and which connects the hand block D, with the forearm splint A.

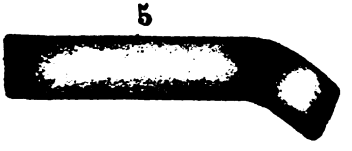
FIG. 4. *Smith's Splint reversed.* From this view it is apparent that the hand block D, moving upon the pivot E, is capable of describing the radius of the circle C C. The nut F, which communicates with the brass plate of the forearm splint B, retains the hand block at any desired angle.

FIG. 5. *The author's Palmar Splint* for the same.

FIG. 6. The author's splints applied. The curved palmar splint is not in view—only the dorsal. The dotted lines represent the roller. The sling is omitted for the purpose of bringing the other dressings more distinctly into view.

Pl. IV.





C.E.LEWIS . DEL.

REPORT

OF THE

COMMITTEE ON HYDROPHOBIA.

REPORT ON HYDROPHOBIA.

It will be remembered that, at the meeting of this Association in St. Louis in 1854, a communication was read from a gentleman of New York on the subject of hydrophobia, touching the popular belief in sidereal influence or hot weather as a predisposing cause of rabies canina; that a committee was appointed to collect facts and report to a subsequent meeting. At the meeting in Philadelphia a report in part was read, but, inasmuch as the facts collected were so few, the committee at their own request were continued. We propose, therefore, at this meeting to report the result of our labors.

Since the last meeting of this Association, circulars inviting the necessary information have been extensively distributed, but your Committee are sorry to say the response has been but feeble. If your Committee could feel satisfied that want of material was the cause of silence, they certainly should not regret that the answers have been "few and far between." But we judge it to be otherwise, or else the periodical press is raising unfounded notes of alarm.[1]

A large proportion of the cases herewith presented have been obtained by personal application to individuals whose names were made public as connected with their occurrence. But notwithstanding the general backwardness of our professional brethren to forward communications, your Committee believe they are enabled to present a larger collection of cases of this terrible disease than has ever before been presented to the American public especially at any one time. Some of them will be found of exceeding interest apart from their scientific importance. The Committee, it will be perceived, have confined their inquiries to cases occurring only on this continent, and mostly to those affecting the human subject.

[1] "One hundred deer in Stainborough Park, England, have died this spring of hydrophobia."—*Boston Post*, 1st May.

The main object of our inquiry has been to ascertain, if possible, whether hydrophobia prevails more at one season of the year than at another; whether the community is more in danger from the bite of rabid animals in hot weather and during "dog days," than during the colder months of the year; the proof, therefore, of the existence of rabies canina in any place and at any time is what we seek; and whether the virus is communicated to man or brute, the fact is equally apropos to the task assigned us, though not of equal importance to the community where it exists. We have confined our inquiries to the United States, because we thought the facts elicited would make a deeper impression upon the public mind the nearer they come to our own firesides, and because, as we shall see by and by, the investigation has already been undertaken in Europe, and the results given to the public.

Hydrophobia, or rabies, seems, from the earliest records of the disease, to have been regarded as originating in the dog, or animals of the same genus; and hence the disease in the human subject was called *canine* madness by English writers; and, although the disastrous effects of the bite of the dog have been observed for a period of more than two thousand years, and are so obvious as to have been almost universally admitted, the reasons why the *dog* especially should be capable of originating or developing the disease, have always been, and still are, subjects of doubt and speculation; and hypotheses have been framed as various and conflicting as the causes to which the disease has been attributed, and as unsatisfactory as the various unsuccessful means that have hitherto been proposed for its cure.

The principal causes to which the origin of rabies has been ascribed, or which have been supposed to favor the development of the disease in *dogs*, are want of food, or extreme hunger; want of water, or violent thirst; putrid food; drinking stagnant water; climate; particular seasons of the year; intemperature of the weather, as the extreme rigor of winter, or the immoderate heat of summer; and, in combination with the latter, *especially* a certain mysterious influence which Sirius, the dog star, is supposed to exert over the canine race. It is scarcely credible that such different and opposing causes should produce the same results without the co-operation of some other circumstances. The prevalent opinion seems to be, that the fiery dog star, who is in the ascendant in the northern hemisphere during the heat of summer, not only predisposes *dogs* more than other animals to become rabid, but that he

also gives intensity to the heat of the atmosphere, which, with the putrid or putrescent food and drink, or rather want of drink, excites a fever in his system, and infuriates him to madness. Although this sidereal fancy is not endorsed by any medical authority, several authors assert and maintain the thermal hypothesis, and both appear specious and plausible from the fact of their concurrence with most of the other alleged causes of rabies.

On the other hand, it is maintained by Le Roux and others that rabies prevails most during the coldest weather of the winter season, when, they say, wolves become mad from hunger and want of prey, on account of the deep snows, as well as from thirst, in consequence of the springs and streams being frozen over. Others, among whom are Boissier and Sauvages, assert that the disease occurs most frequently under *both* extremes of temperature of winter and summer; while a fourth class, among whom is Andry, maintain with equal confidence, as the result of *their* observation, that "the months of January (the coldest) and August (the hottest) of the year offer the fewest cases of this disease," and that it is "during March and April there are most mad wolves, and that during the months of May and September the greatest number of dogs are afflicted with madness."

The disease is of frequent occurrence in France and Northern Europe, as well as in the Northern States of this Union. On the continent of Europe especially is it so, as will appear from the following curious statistical table of its ravages in Prussia: In 1810, there were 104 deaths from hydrophobia in that kingdom; 1811, 117; 1812, 101; 1813, 85; 1814, 127; 1815, 79; 1816, 201; 1817, 228; 1818, 260; 1819, 356. Total, 1658. (*Edinburgh Med. and Surg. Jour.*, 1824.) This considerably exceeds the number of authenticated cases known to have been put on record throughout the world when Dr. Hamilton wrote his book in 1798. The deaths were most frequent in the Provinces of Marienwerder (228) and Bromberg (162). In Breslau it was 90; in Opplu, 53; in Trier, 46; in Aachen, 58. On the contrary, not a single case occurred in Stralsund, and it was rare (5) in Dusseldorf and in several other places. Hufeland observes that those provinces in which it is most abundant are contiguous to forests containing wolves, to the forests of Ardennes, of Russia, and of Poland. Hydrophobia is very rare in Sweden. In England and in this country, it seems to occur most frequently in cold or mild weather. Dr. Mease says: "During several hard winter months within my remembrance in this city

(Philadelphia), dogs very commonly went mad. This was particularly the case in that of the year 1779–80, when more of those animals perished by the disease than for a long time before. Throughout Maryland, I am informed on very good authority, it was still more general." "In the winter of 1807," says Dr. Lipscombe, "canine madness raged epidemically at Dover (England) and some of the neighboring towns;" and "three men" are reported by Dr. Haygarth, of Chester, as having "died of hydrophobia at Wrexham, North Wales, in the *autumn* of 1778, and spread great alarm." Dr. White, of St. Edmundsburg, writes to Dr. Lettsom, under date of June 4th, 1792, as follows: "In the last nine months, this part of the country has been terribly infested with mad dogs, during which time it has been my misfortune to be applied to by several persons who have been bitten. Seven of these miserable objects were bitten by dogs. * * * Three others were bitten by a *cow* that had the hydrophobia. All of these except two had the injured parts wholly dissected out three days after the bite, the wounds well washed first with cold and then with warm water, and the surfaces touched with lunar caustic. One of the excepted two was bitten in the palm, and on the back of the hand; as much of the wounded part as could be with safety was removed, and the process of ablution continued for two hours. In the other instance, the tooth of the cow had penetrated the end of the finger, on which account I thought myself warranted to deprive the patient of the first joint. I was also consulted about a foal bitten by a mad dog about five days previously through the wing of the left nostril; the wounded part was cut out, and no other means were used. The animal remained well, while a horse, and cow, and two pigs, bitten by the same dog on the same day, to which internal remedies only were administered, all died within the month. * * * Two persons on whom excision and ablution had not been performed, and to whom medicine of false repute had been given, fell wretched victims to their credulity." (See appendix to *Essay on Hydrophobia*, by James Mease, M. D.)

This letter shows that during nine months, embracing autumn, winter, and spring, and excluding summer, with "dog days," there were at least seven mad dogs, *probably* more, one mad cow, and two rabid human beings in that part of the country during that period, all of whom died. It shows also the importance and *probable* efficacy of *excision* and thorough ablution of the wound several days

after inoculation, of which additional examples will be given in another place.

Rabies seems to be a rare disease in tropical climates.[1] Savary says: "The disease is not known in the Island of Cyprus, or Syria bordering on the sea;" "nor is it ever seen in Egypt," says Volney, which is confirmed by Larrey in his work on military surgery (vol. ii. p. 226, French edition). Prosper Alpinus, who resided in Egypt three years, as physician to the Venetian consul, says the same thing. Dr. Barrow says: "It is extremely rare at the Cape of Good Hope, and in the interior of Caffraria." According to Dr. Mosely, the disease is unknown in the Island of Antigua, and Drs. Hamilton and Mosely both state that "there was not a single case in Jamaica for a period of fifty years previous to 1783." Dr. Thomas, too, who also lived in the West Indies a long time, never saw a case, or heard it spoken of while there. It is the testimony of a number of travellers that in all India, although dogs are quite numerous, the disease *was* equally rare; we say it *was*, for Dr. Daniel Johnson says that rabies is *now* very common there. This apparent immunity from the disease in some tropical countries may, at first view, seem to be the effect of *climate*. That such is not the case, however, is probable from the fact that that disease has, in several instances, originated, or been developed there, and when existing has spread as readily by inoculation as elsewhere. Such was the case in India, as stated by Dr. Johnson, and also in the Island of Crete, where the disease was formerly of frequent occurrence. The prevalence of rabies in Crete was the consequence of a peculiar occupation of the island. The inhabitants were dog-fanciers. They had many choice varieties of the animal, the breeding and sale of which for exportation were a source of considerable revenue. From the very nature of the case, dogs were very numerous and well fed. Dog-fights, of course, must have been very common, and the disease was probably produced, as it is in all other countries, independent of climate.

Although statistics of rabies go to show that, contrary to popular prejudice, it occurs most frequently in cold countries, and during autumn, winter, and spring, still it appears that of the whole number of cases that occur out of the tropics, during the year, *nearly* an equal proportion occur during each month of the year, from which it may be inferred that the appearance and prevalence of the disease, at particular seasons, and in certain localities or regions, are

[1] See Dr. Green's testimony in Case 102.

accidental, and in no way connected with, or produced by, any thermal or sidereal influence.

Allied to the hypothesis just considered is that of the spontaneous development of rabies by "some peculiar influence of the air." It was maintained by Boerhaave, and subsequently by Lipscombe, and Mosely. The latter says: "It generated the canine madness in the year 1783, in the West Indies, for it was general, and many dogs were seized with it, that had no communication with others, and some dogs which were brought from Europe and North America, and that were not on shore, went mad on their arrival in the harbors of the islands." But Dr. Hamilton says: "The dogs from the United States communicated the disease to those on the islands." In view of this solitary instance, as far as we know, in favor of the peculiar influence of the air, and *that* positively contradicted by equally, if not more reliable authority, and the probability of the dogs on board of the ships having been bitten before they were shipped, and had the disease in a state of incubation, ready to break out on their arrival there; and also the probability of intercourse between those on shipboard with those on shore; the agency of such an impalpable cause is not only doubtful but wholly inadmissible.

That putrid meat, or want of food and drink, never generates the disease in the dog, has been satisfactorily proved by experiments. Dogs have been confined under circumstances supposed to favor the development of rabies, and fed altogether on putrid meat, for a considerable time; or food and drink have been withheld from them, under similar confinement, so as to produce the most ravenous hunger, and violent thirst, without ever producing the disease. In accordance with the results of these experiments is the testimony of travellers that "in Constantinople, where dogs are the only scavengers, these animals, half starved and gaunt from want of food, are constantly seen about the streets devouring greedily any putrid meat they can find." "In Egypt," says Larrey, "dogs stray away into the country, and feed on the carcasses of animals that have been left unburied;" and Dr. Barrow says the same of Caffraria and other countries where rabies is scarcely known; not that dogs in those countries live entirely on flesh, but that the little flesh they get is *putrid*.

After this brief and hasty examination of the evidence for and against the generation or development of rabies, by the causes we have considered, we are driven to the humiliating acknowledg-

ment, frankly avowed by the authors of the article on rabies in the French Dictionary of the Medical Sciences, "that the true cause of the disease is not known, or very imperfectly understood."

In view of the conceded inadequacy of all the external causes we have considered, to account for the origin of the disease, and the fact that nearly every case of genuine rabies has been traced to the bite of some animal, it is fair to conclude, *it never proceeds from any other cause.* In most cases (but not in all) the disease followed the bite of animals known to be rabid, or was communicated by inoculation of the virus into an abraded surface, proving to demonstration its contagious character. The communication of a disease from one person or animal infected with it, to another, is a fact so often observed in smallpox, measles, and syphilis, as well as rabies, as no longer to excite any wonder, but is regarded as the natural consequence of the operation of the law of contagion, and therefore is not the subject of our inquiry. But, as all contagious diseases must have an origin, and as in several instances rabies has followed the bite of dogs and other animals free from the disease, such cases give most decided intimations, if not positive proof, that the germ of the disease is in these animals, and that to *them* we should direct our inquiries.

As there are several animals whose bite has been followed by rabies, a very natural suggestion is, that the germ or the faculty of exciting it to action must result from some organic or physiological peculiarity common to, and characteristic of all these animals; and such is the fact: they are all distinguished for the peculiar form of their teeth fitting them in a wonderful manner for seizing and holding their prey, and for rending and tearing flesh; they are all carnivorous, and, from a law of their being, ferocious and irascible, and it is probable that their peculiar liability to rabies consists in a *constitutional irascibility.*

The ferocity of all these animals in a state of nature is well known; that it is dependent on and modified by the food they live on, is also certain. Witness, for instance, the difference between the fierce wolf and his kin, the gentle house dog, whose temper has been mitigated and subdued by mixed aliment, or, what is to the same purpose, the well-known fact that butcher's dogs, who live almost exclusively on the refuse of the shambles, become very irascible, returning in some degree to their original savage habits, notwithstanding their domestication; while the wolf, kept in close confinement and fed upon vegetable matter, becomes tame and harmless.

(See *Godman's Nat. History*, vol. i. p. 182.) The seeming immunity from rabies in some tropical countries to which we have alluded is probably due to the nature of their food; the inhabitants themselves use very little animal food, with a large proportion of farinaceous articles and fruits, and their dogs are fed on the same aliment. In a conversation with Dr. J. B. Flint, Professor of Surgery in the Kentucky School of Medicine, he stated to a member of your committee that he spent a winter on the Island of Cuba, and the answer to his inquiries on the subject of rabies was uniformly, that dogs hardly ever become mad there, and the reason assigned was that, on account of the high price of meats, their dogs were fed exclusively on vegetable food, chiefly *mush* or cooked farinaceous plants or grains.

The temperament of the dog is one of excessive irritability; his nervous system is largely developed, and exerts an influence over all his actions; his senses of smelling and hearing are very acute and active; his brain is seldom in repose, even when asleep, as the twitchings of his legs and the sounds he utters show that he is dreaming; and most of his diseases are attended by nervous excitability ending in delirium before he dies, indicating their cerebral or spinal character.

The dog is more prone to anger than any other domesticated animal; and the watchfulness for which he is so highly valued by man, as a faithful sentinel to warn his master of the approach of burglars or assassins during the night, results probably from this irritability of his temper, as well as from the acuteness of his sense of hearing: hence he is not only aroused from his sleep by the slightest noise (for the dog sleeps much, even when he is supposed to be awake), but he also becomes highly excited with anger at the cause of his disturbance. This irascible temperament varies in degree in different species of the genus, and in different individuals of the same species, and, as has been stated, is modified by his aliment. In some dogs it is so strong that they are enraged by the most trifling cause, so that they are constantly in a state bordering on madness; affecting the *very* organs in which the virus of rabies is supposed to be generated, in such a manner as to exhibit one of the most prominent symptoms of the disease, *i. e.*, the slaver from the mouth. Under this condition of the animal organs, it certainly seems highly probable that a rabific virus capable of originating the disease may be produced. In default of a more satisfactory solution of this difficult problem, we propose, therefore, with due deference, this *constitu-*

tional irascibility of the dog as the basis of a different, and as it seems to us the true, etiology of canine madness.

The term rabies does not necessarily imply *disease*, but violent passion or strong emotion; it is synonymous with rage, fury, or anger. From the resemblance of the paroxysms of rabies to the manifestation of those passions, the disease is called by the French *la rage*, in contradistinction to hydrophobia, as a symptom often occurring in other diseases. An irascible dog or cat, enraged by a sudden provocation, bears the same relation to a rabid one that an irritable or passionate man, in a sudden tumult of anger, does to a maniac. The difference in both cases consists chiefly in the nature and permanency of the cause. In rabies and mania the causes are morbific and permanent. The rage or fury of mere passion, being excited by a sudden and transient cause, is therefore of short duration. In many cases of rabies in man, the symptoms of mental derangement are not constant, but the patient is, for most of the time, rational, except during the paroxysms and for a short time after coming out of them. If then an enraged dog exhibits so many of the symptoms of rabies, especially the viscid frothy slaver so characteristic of the disease, and which all admit contains the virus, it is reasonable to conclude that the functional condition of the organs implicated in the disease, the very organs in which it is supposed the virus is generated, is in both cases very similar, and therefore capable of generating the virus. That the bite of such an animal should be followed by rabies is a most rational conclusion, and if such be the case, it is probably the *only* way the disease ever originates. In support of such a conclusion we refer to several cases in this report. See Cases 2, 14, 23, 24, 30, 31, 34, 44, 63, 86, and also the following authors:—

1. Morgagni relates a case of rabies "occasioned by the bite of a cat that was not rabid."

2. Doctor le Dulx, a Batavian physician, states that "in several instances hydrophobia succeeded the bite of enraged animals," and says that "the bite of the common domestic cat rendered furious by provocation is well known to produce hydrophobia." (*Transactions of the Batavian Society*, vol. v., quoted by Dr. White in his essay on hydrophobia.)

3. Dr. Lipscombe says: "Dogs in various states and conditions are capable of producing the disease by the inoculation of their saliva," and "whatsoever is capable of exciting anger or agitation

seems likely to contribute to the production of rabies." (*History of Canine Madness*, page 41.)

"From a very early period it has been a common notion that the bite of an animal is very malignant when inflicted in a fit of anger." (Morgagni, *De Causis et Sed. Morb.*) In the French Dictionary of the Medical Sciences, is the case of "a child which died of rabies, the consequence of the bite of a dog which was not at the time of the bite, nor did it afterwards become, rabid." The same was the case with the dog that bit Dr. Neuman's patient, No. 63.

This view of the origin of rabies accounts for the frequency of its occurrence among wolves in the forests of Russia, and formerly in the North of France, as stated by several writers. Wolves are known to be gregarious animals, and herd together. Even in pursuit of their prey, they seldom go singly. Two or more hungry wolves, after an exciting race, overtake and capture the object of their pursuit; each one, goaded on by a greedy appetite, tries to appropriate more than his share, and they fall out over the spoils, become enraged, and in the *mêlée* bite each other, and rabies follows. It explains too the sudden appearance of the disease at particular times and in localities where it had not been known previously for a long period, as has been the case the past winter. For instance, two quarrelsome dogs engage in a fight, and become more and more enraged by the wounds mutually inflicted and received; at last they become so infuriated as to pant and foam at the mouth; from the well-known effects of the passions on the other secretions, we may well conclude that the *saliva* or *slaver* of such dogs is of a morbific character, and that their bite at such time may produce hydrophobia. There are instances of persons who, in their humane attempts to separate fighting dogs, have been bitten by them, and have afterwards died of rabies.[1] To the objection that dogs frequently fight without any such serious consequences following, it is sufficient to say that the bite of dogs *known* to be mad is only in a few instances followed by madness.

Dr. Carpenter, in his work on Physiology, relates *several* cases showing the immediate depravation of the secretions by strong emotion or passion, one of which is so apropos that we must make room for it here. "A carpenter fell into a quarrel with a soldier

[1] Instance Case 30, reported by Dr. Clark, of Woodbury, N. J., and a similar calamity resulted to a gentleman of Compton Street, London, who was bitten in the attempt to separate two fighting dogs, reported by Dr. Mosely. Indeed, most writers concur in the opinion that rabid dogs *never* fight.

billeted in his house, and was set upon by the latter with his drawn sword. The wife of the carpenter at first trembled from fear and terror, and then suddenly threw herself between the combatants, wrested the sword from the soldier's hand, broke it in pieces, and threw it away. During the tumult, some neighbors came in and separated the men. While in this state of strong excitement, the mother took up her child from the cradle, where it lay playing, and in the most perfect health; never having had a moment's illness. She gave it the breast, and in doing so sealed its fate. In a few minutes the infant left off sucking, became restless, panted, and sank dead upon its mother's bosom." (*Carpenter's Human Physiology*, p. 944.)

Although not strictly within the scope of this inquiry, it will not be out of place to notice very briefly so much of the pathology of rabies as appears to be of practical importance.

It seems to be still a question, what place rabies should occupy in a system of nosology; some consider it an inflammatory disease, while a large number, among whom are Marcet, Portal, Mease, and others, view it in the light of a *nervous affection*. M. Trolliet says: "Regarded in a certain aspect, rabies should be placed among nervous diseases, especially the first symptoms; but, considered with respect to the traces which it leaves after death, it seems to be of an inflammatory nature. In effect, it presents itself at first as a manifest lesion of the function of the brain, the senses, and the nerves. But very soon a catarrhal affection of the air-passages supervenes, and finally a suffocation, and even true asphyxia." He says the salivary glands are always found in a healthy state, and hence concludes that the virus is not generated in them. From the evident symptoms of disease in the *air-passages*, and their morbid appearance on dissection, he infers the virus is generated there, and is mixed with the frothy mucus of those parts, which together constitute the slaver that propagates the disease.

The manner in which this singular virus operates, or the medium through which it produces its astonishing effects on the system, at periods differing so much in duration, in different cases, is as great a mystery as ever. The fact that the disease has been prevented by excision of the cicatrix after it had become painful, swollen, and discolored, a group of symptoms, known by the term recrudescence, and which is the harbinger of rabies, and always followed by the disease under any *other* treatment, is positive proof that the virus is not directly absorbed into the system. Hunter and Munro both

affirm that "the disease may be prevented by excision at any time before the occurrence of the second inflammation." Dr. Marcet recommends "excision at *any* time before the general symptoms come on." Poiteau advises "a trial of it even after rabies has come on." A man had a painful cicatrix cut out 25 days after the bite, then volatile alkali was applied to the wound and a dressing of emplastr. vesicator. The man remained well, while several animals bitten by the same dog died of rabies within five months. (*Journal Générale de Méd.*, tome xxx.) D. Blane, an English veterinary surgeon, although a believer in absorption, says: "The bitten part may be cut out at any time previous to the secondary inflammation, or at the end of one, two, or three weeks." The following is his theory: "The poison is immediately absorbed, and taken into the constitution, but remains dormant until called into action; and before it can produce any of its effects, it must raise a secondary inflammation, in the original bitten part, and unless this inflammation takes place no mischief can ever ensue. Consequently, when the bitten part has been removed, no secondary inflammation can take place." Mr. Blane, according to his own account, enjoyed rare opportunities for observation in the English metropolis, and therefore speaks with great confidence: "That it is of no consequence that the excision of the part should be immediately effected, but, as secondary inflammation may come on at any time, he advises to have it done as soon as convenient." (*Essay on Hydrophobia*, by D. Blane, Professor of Animal Medicine, London.) Mr. Blane's practice, though in conflict with his theory, is no less valuable on that account.

The application of caustics and cauteries to the cicatrix on the appearance of recrudescence, and keeping up a discharge from the part, is said also to have prevented the disease.

Dr. Mease disproved and rejected the notion of absorption, and says: "I am disposed to embrace the idea of the operation on the nerves." He believes the poison *lies dormant in the wound* for some time. And at length, in various periods in different persons, begins to show its effects on the system at large. He quotes Morgagni in support of that view, and Salius, who says "the poison is carried by the *nerves* to their origin." Drs. Percival and Vaughan hold the same opinion.

Dr. White, in the letter to Dr. Lettsom before referred to, remarks: "The first sensible mark of action is a pain in the injured part, and the consequent symptoms and sensations have a nearer rela-

tion to spasm than inflammation. The lymphatic system is not affected as it is from the insertion of variolous or any other infectious matter carried into the habit by absorption. The virus probably *lies dormant*, till the pain in the bitten part comes on, and therefore excision and ablution might afford relief at that time, and even when the patient is afflicted with hydrophobia."

Dr. Gilman says: "In the determination of the question as to the time when the extirpation of the parts infected may be performed, it is of great importance to consider whether the poison does not *always* remain in the substance where it is first diffused, until by inflammation or by some other cause a sufficient dose is generated to infect the whole system. Indeed, the notorious connection between a painful and inflamed state of the original wound, immediately preceding the constitutional symptoms, warrants the supposition, and points out the expediency of removing or destroying the parts to the last." (*Diss.* p. 109.) "The pain in the bitten part, at the time the symptoms of hydrophobia come on, is felt in the course of the nerves, and not along the absorbents." (*Dr. Marcet.*)

Contrasting the effects of the poison of smallpox and lues venerea with that of rabies, Dr. Percival remarks: "*Their* progress into the course of the circulation may be readily traced, which is not the case with the poison of a mad dog," and then asks: "Are we then fundamentally right in the idea that the bite of a rabid animal operates by absorption? Might not its effects be as well, if not better explained, by ascribing them to local nervous irritation, propagated in different periods of time, according to the varying circumstances of sensibility and irritability to the brain, and from thence to the fauces, gullet, and stomach? are not all the symptoms of the nervous or spasmodic class?"

"Many medical writers have despaired of excision unless it is employed within a few hours, and perhaps a few minutes after the wound, on the supposition that after a very short time the poison must have mingled with the blood of the bitten animals; but it is well known that the poison lies *long dormant* and inactive in the part to which it was first applied, and, therefore, it is proper to perform excision, not only before the wound is healed, but even at any period before the constitutional symptoms have commenced." (*Cases of Tetanus and Hydrophobia*, by C. H. Parry, M. D., F. R. S., London, pp. 132, 133.)

"The hydrophobic poison requires a period of incubation, and often remains long undeveloped in the nest provided for it, when at

length circumstances favor the hatching process; the new brood leaves its birth-place in the cicatrix and carries destruction into the system. A consolatory inference from this view is that, if the nidus be wholly removed before the hatching is completed, the mischief may be entirely prevented." (*Wood's Practice*, p. 757.)

These instances of and remarks on the probable success of excision after long delays, like that of repentance at the eleventh hour, while they encourage us to hope, even to the very accession of the disease, should not, however, tempt or induce us to defer the operation for a moment, but it should be performed, when practicable, as soon as possible after inoculation. If the result of our inquiry be not that of entirely correcting public opinion on this subject (and we are not vain enough to presume it will), by showing that cold weather does not afford immunity from the contagion of rabies, and that danger is by no means confined to summer, we have the satisfaction of believing that our labors will not prove altogether abortive; we feel that we have done something towards correcting it. In addition to a result so much to be desired as correct views upon a subject of such vital import, your Committee also feel no little satisfaction in being made the medium of placing upon record an amount of information regarding hydrophobia in this country, which will enable some diligent student by comparison, analysis, and arrangement to arrive at a better knowledge than we now possess of this very singular disease.

Besides those cases which your Committee have received from gentlemen, most of whom have been long and favorably known to the profession, they have received others from individuals professing to destroy the latent virus by some secret remedy; one individual, in particular, has furnished what he calls 39 cases, only one of which, he says, had hydrophobia! Of course your Committee could make no use of information from such sources. We think the cases reported sustain us in the opinion before expressed, that either excision or amputation of the part inoculated is the only reliable prophylactic, and affords the strongest ground of hope to any one bitten by a rabid animal, or one enraged, and that even that remedy is better late than not at all, as witness Dr. Jackson, Case No. 75.

Tardieu's report, a short notice of which may be found in the July No., 1854, of the *Amer. Journ. Méd. Sciences*, is made up entirely of cases of hydrophobia in the human subject. He details 48 cases occurring in France, in 1852, and has arranged them in groups corresponding to the four seasons of the year. The date of

inoculation was observed in 40 cases, 10 having occurred in the first quarter beginning with March, 16 in the second, 4 in the third, and 10 in the last beginning with December. "But," says he, "as this is an inquiry into the influence of temperature more particularly, would it not be more natural to divide the year into two equal parts, so as to include in each severally the extremes of high and low temperature. Then, beginning with December and ending with May, we have just half of all the cases noted, and the heat of summer, and the mild temperature of autumn, furnish the other half." This division might answer for France, but, with regard to the northern section of the United States, from which nearly all our cases are derived, we have really but four warm and eight cold, or cool months. All Tardieu's cases are traceable to the bite of the dog. Now, as hydrophobia in the human subject arises almost entirely from this cause, do not the statistics of the disease in dogs claim attention, at least more than the subject has generally received?

The date of inoculation and the period of incubation, or latency, are also important items of observation, inasmuch as from them alone are we to determine whether the disease is hastened or retarded by the temperature of the atmosphere. This report of Tardieu's, therefore, is not so complete as it would have been if the date of the bite and the accession of the disease had been noted in each case. Notwithstanding this, however, it is an invaluable paper.

Hydrophobia is a disease about as rare as it is fatal.[1] There are many physicians, and among them some of large practice, who have never seen a case of it, and especially is this true in regard to those in the southern section of the Union; and as to its fatality, how few among us have ever yet been enabled to record the successful issue of a single case. Many physicians, and some of them gentlemen of intelligence, even doubt its existence as a distinct disease, a disease having a specific origin. Dr. Marriot, of London, has written a book to prove the *impossibility* of its being produced by the bite of a dog!

It is therefore evident that no one practitioner sees enough of hydrophobia to enable him to judge correctly from personal ob-

[1] "The subjects of hydrophobia have fallen victims under almost every treatment, and if the genuine disease has ever been cured, such cures are merely insulated facts, from which no general principle can be deduced, for perhaps the means of cure in all of them have been different, and the very next case that occurred has been fatal under apparently the same treatment, and with apparently the same symptoms."—*New England Jour.*, 1812.

servation alone whether one month in the year more than another favors its development, or the warm season more than the cold. It is only by an *esprit du corps* of the members of the profession collectively, and united efforts as collaborators in the wide field of observation, that we can ever hope to arrive at a correct knowledge of its nature, and thus if ever reach the remedy so greatly desired.

The history of the cases which have occurred in the United States, as well those which heretofore have been given to the public as those which we are now enabled to present, it seems to us furnishes statistics which should satisfy the most fastidious. It may be remarked, also, that in all but one of the cases reported as recovering after hydrophobic symptoms had manifested themselves, the period of incubation was very much shorter than in those cases which terminated fatally. Witness Cases 17, 77, 81, 90, 97, the average being only 15 days, whereas the general average is 66.

From a reference to the tables annexed, it will also be perceived how strongly they confirm conclusions drawn from similar statistics in Europe. Dr. Radcliffe, of England, has made an analysis of 109 cases of hydrophobia. In 84 the month is stated in which inoculation took place. Of these, January furnishes 3; February, 14; March, 8; April, 6; May, 16; June, 5; July, 5; August, 5; September, 6; October, 3; November, 5; and December, 6: or the first quarter of the year, beginning with March, 30; second quarter, 15; third quarter, 14, and last quarter, ending with February, 23.

Every investigation, and anywhere made, only proves that a belief in the influence of the "dog star," or climate, or season of the year, as inducing or favoring the production of rabies, is an utter fallacy, a mere astrological fancy, handed down it may be from remote ages, its very antiquity, perhaps, shielding it from the probe of investigation, but yet entirely unsupported by facts. Laws based upon such an hypothesis are a reproach to the nineteenth century, and not only absurd, and their execution expensive and cruel, but positively injurious to the community, inasmuch as, during the colder seasons of the year, when Sirius is not in the ascendant, they are off their guard, and thus, lulled into a false security, are consequently more exposed to danger.

A reference to the tables will also show that very few cases of hydrophobia result from bites on parts of the body protected by clothing. The cases reported are almost uniformly from bites upon exposed parts of the body, such as the fingers, hands, face, nose, ears, &c. &c. They also show that it is not necessary that the

animal inflicting the wound should itself be diseased. Temporary anger, produced by harsh and cruel treatment, is noticed in several of the cases as preceding the infliction of the injury which resulted in all the symptoms of well-marked hydrophobia.

In some few of the cases received, the period of inoculation is not mentioned; where this has occurred, your Committee have taken the usual average of determined cases, which is about 40 days, and counting backwards have assumed the date reached as the period of the injury; this, however, occurs in but very few instances.

The statistics also indicate with sufficient clearness the course which legislative and municipal authorities should pursue in reference to this subject. They demonstrate that an attack of hydrophobia is invariably preceded by the bite of a dog or other rabid or enraged animal, and that no one season of the year affords any immunity from the danger of inoculation. They confirm, too, as might have been expected, the results of the MORTALITY STATISTICS of the late census of the United States, carefully prepared by the superintendent of the census, J. D. B. De Bow, Esq. We there find that, during the year ending 1st June, 1850, there were reported 26 deaths from hydrophobia, as follows: Georgia 1; Illinois 1; Louisiana 1; Maryland 1; Michigan 1; New Hampshire 1; New Jersey 1; New York 3; North Carolina 1; Pennsylvania 2; Rhode Island 4; Vermont 2; Virginia 4; New Mexico 3. And the seasons of the year were as follows: 1st quarter, beginning with March, 7; second quarter, 7; third quarter, 3; and the last quarter, December, January, and February, 9; total, 26.

It will be seen that several of the communications notice the existence of "dog laws" in their several localities in force mostly during the hot months of the year; but none of them embracing the whole year.

Thus it seems to your Committee that a very strong case has been made out, though not as strong as it would have been could they have presented the Association with a longer catalogue of cases; for it is certain that with all their diligence they have collected but a small number of those which have occurred in the United States. Enough, however, is here presented if brought properly before the community, as it is in the power of this National Association to do, to produce results, under the operation of the law of self-preservation alone, favorable to human life and happiness, however destructive it might prove to the canine and feline races. The committee do not feel called upon to recommend any specific course of ac-

tion for legislators to pursue. They merely state facts as they find them, and facts they think sufficiently suggestive. The simple question seems to be, Shall human or canine life be protected by the ægis of law?

It will be perceived that, in order to bring certain classes of facts together for comparison and convenient observation, we have arranged the cases in five columns. 1st, the number of the case; 2d, the name and age of the patient, stating the part of the body injured, and the animal inflicting the wound, together with the authority; 3d, the time of the bite; 4th, the time when sickness commenced; and 5th, the termination.

The cases presented for publication as part of this report are cases never yet published, and are furnished by those witnessing the facts they relate. The cases derived from books are duly credited.

A Schedule of Cases of Hydrophobia occurring in the United States.[1]

CASE.	DESCRIPTION AND AUTHORITY.	BITTEN.	SICKENED.	DIED.
1	Boy 11 years old; by raccoon, on thumb. Reported by George Russell, M. D., Lincoln, Mass.	Oct. 16	Nov. 27	Dec. 3
2	Boy 7 years; by dog, enraged not mad, on little finger. By E. Coale, M. D., Boston.	Sept. 17	Oct. 7	Oct. 11
3	A youth 18 years old; by dog, on wrist. By Dr. Curtis, Lowell, Mass.	July 29	Nov. 4	Nov. 8
4	Boy 7 years old; by dog, on eye and mouth. By Dr. Hayward, Am. Med. Journ., 1854.	Aug. 13	Sept. 12	Sept. 16
5	Girl 7 years old; by dog, on hand, elbow, and face. By Dr. Cabbot, Am. Med. Journ., April, 1854.[2]	Dec. 18	Jan. 20	Jan. 22
6	J. W. H., 15 years; by dog, on calf of leg and ear. By Dr. C. D. Homans, Boston Medical Journal, March 8, 1854.	Jan. 27	Feb. 26	Feb. 28
7	A man, 23 years; by dog, on hand. By J. S. Fogg, Boston Med. Journ., April 19, 1854.	Feb. 8	April 6	April 10
8	Son of Wm. Craft, 8 years; by dog, on nose. By P. Moulton, New Rochelle, N. Y.	Feb. 18	March 25	March 27
9	A man, 35 years; by dog not mad. By Dr. Casselberry, Evansville, Indiana.	Dec. 16	Jan. 16	Jan. 18
10	A boy, 9 years; by dog. By Dr. Casselberry, Evansville, Indiana.	Jan. 1	Jan. 13	Jan. 17
11	Mrs. E. Riley, 34 years; by dog, on left arm. By Dr. W. L. Atlee, Philadelphia, Pa.	Nov. 3	Feb. 9	Feb. 13
12	Boy, 8 years; by dog, on leg. By Dr. Blatchford, Troy, N. Y., Boston Med. Journ., July 26, 1854.	Sept.	Aug. 30	Sept. 2
13	Boy, 8 years; by dog, on leg. By Dr. Blatchford, Troy, N. Y., Boston Med. Journ., July 26, 1854.	Sept.	Sept. 9	Sept. 11
14	Mr. House, 30 years; by dog, not mad, on hand. By Dr. Blatchford, N. Y. Annalist, 1847.	Sept. 23	Nov. 9	Nov. 13
15	A man, 28 years; by dog, on hand. By James Thorn, M. D., Troy, N. Y., Boston Med. Journ., July 26, 1854.	Feb. 4	March 19	March 23
16	A girl, 6 years; by dog. By Dr. Trail Green, Easton, Pa.	March 11	April 22	April 22
17	Mrs. S., 57 years old; bitten on the finger. By Dr. Samuel Hart, Brooklyn, N. Y.	June	In 14 days	Well
18	Several animals bitten by dog in Oswego; all died. By Dr. Hart, Brooklyn, N. Y.	January		
19	Cornelius Wurgeis, 22 years old; by dog, on hand. By Dr. T. Turner, Brooklyn, N. Y.	Nov. 12	Dec. 14	Dec. 19
20	N. C., laborer, 45 years; by dog, on hand. By Dr. Turner, N. Y. Journ. Med., Nov., 1855.	May 12	Aug. 9	Aug. 30
21	Mrs. Willard, of Buffalo; by a cat, on hand. By Dr. G. N. Burwell, Buffalo, N. Y.	Jan. 21	March 24	March 28
22	Mr. Gould, of Hamburg, 57 years old; by dog, on arm. By Dr. G. N. Burwell, Buffalo.	May 14	July 2	July 5
23	Jos. Mallet, of Providence, R. I.; by his own dog, not mad, on lip. By Dr. F. H. Peckham, Providence, R. I.	Feb. 19	March 4	March 9

[1] For the first seven cases, your Committee are indebted to the researches and kindness of our friends, Drs. J. B. S. Jackson and C. B. Homans, of Boston. They embrace, it is believed, all, or nearly all, the cases of hydrophobia recorded as occurring in that vicinity.

[2] See an interesting *conversation* on hydrophobia, in Am. Med. Journ., April, 1854.

Cases of Hydrophobia occurring in the United States—Continued.

CASE.	DESCRIPTION AND AUTHORITY.	BITTEN.	SICKENED.	DIED.
24	Henry Hopkins, 28 years; by dog, not mad, on finger. By Dr. Stephen C. Griggs, Providence, R. I.	July 23	Oct. 21	Oct. 23
25	Mr. John White, of Camden, N. J.; by cat, on forefinger. By Dr. Thos. F. Cullen.	June 28	Sept. 5	Sept. 9
26	Several hogs, cows, and horses, bitten by dog, and died mad, in Spencer County, Indiana, 1839. By J. B. Sanders.	Sept. 20		Died from 9 days to 4 weeks
27	Robert Adams, of Louisville, Ky.; on finger, by dog. By Dr. Hewett, Western Journ. Med., Sept., 1849.	May 16	July 25	July 27
28	Isaac Murphy, 25 years; by dog, on hand and wrist. By Dr. C. F. Clark, Woodbury, N. J.	March 7	May 14	May 17
29	A horse sickened in one week. Do.	March 7	March 14	Shot
30	A pig; by dog. By Dr. C. F. Clark.	Jan. 1	Jan. 29	Jan. 31
31	Avery Newland, 15 years; by small dog. By Dr. Ariel Hunton, Vermont.	April 19	May 23	May 25
32	A cow; by a dog, in Gaines, N. Y. By Dr. J. H. Beech, Mich.	Feb.	6 days	Next day
33	A lady; by a dog. Ten years after, broke her arm and died of rabies. By Dr. Beech, Coldwater, Mich.			
34	Michael Casey, 40 years; by dog, on hand. By Dr. G. D. Ayres.	May 31	Aug. 9	Aug. 13
35	Henry Uthoff, 28 years; by dog, on hand. By Dr. Roelker, Cincinnati.	May 17	June 30	July 4
36	Mrs. Jane Porter, 65 years; by cat, on hand. By J. E. Pearson, Vienna, Ala.	Summer	3 mos.	3 days
37	Stephen Lee, 64 years; by dog, on finger. By Dr. Fountain, Am. Med. Monthly, 1856.	May 1	Oct. 1	Oct. 10
38	John Wolman, 38 years; by dog, on finger. Phil. Med. Journ., vol. i. 1820.	Nov. 2	Nov. 28	Nov. 30
39	Edward Bransfield, 28 years; by dog, on lower lip. By Dr. J. H. Griscom.	April 5	May 11	May 15
40	A German, 45 years; by dog, on hand. By Dr. J. L. Smith, N. Y. Journ. Med., Sept. 1855.	Nov.	March 16	March 21
41	Thomas Brothers, 28 years; on tendo-Achillis. Philadelphia Med. Museum, vol. iii.	June 10	July 4	Well
42	Mrs. Rodgers; by dog in 1825, and again by dog, not mad, 1856. Dayton Gazette, Ohio.	Jan. 15	March 21	March 25
43	James Coho, 30 years; not known to have been bitten. Buffalo Med. Journ., May, 1855.	Probably Nov.	Jan. 18	Jan. 22
44	Laurence Mier, 34 years; by his own dog, not mad. Buffalo Med. Journ., May, 1855.	July 27	Sept. 14	Sept. 18
45	Dr. J. S. Hawley; by same cat which bit Mrs. Willard (see 21). Reported by himself.	Jan. 20	Parts excised	
46	A lad, 8 years; by dog. By Dr. Z. Pitcher, Detroit, Mich.	May	June	June
47	A lad, 18 years; by dog. Reported verbally by Drs. Donne and Flint, Louisville, Ky. Priapism prominent.	Oct.	Dec.	Dec.
48	Christopher Knowlson; by dog, on arm. Eclectic Repertory, vol. ix.	Feb. 20	June 3	June 5
49	A boy, 6 years, son of Mr. H. Melendy; by dog, on face. By P. B. Miller, M. D.	March 5	March 20	March 23
50	A laborer; by dog, on finger. By P. B. Miller, M. D., Mt. Carrol.	March 5	Parts excised	Well

Cases of Hydrophobia occurring in the United States—Continued.

CASE.	DESCRIPTION AND AUTHORITY.	BITTEN.	SICKENED.	DIED.
51	Horses and cattle; by dogs. By B. P. Miller, M. D., Mount Carrol.	Jan.		Died from 20 to 60 days
52	Horses; by dogs. By Dr. Miller.	Feb.	As above	
53	Mr. Moor, 24 years; by dog, on hand. Reported verbally by Dr. Ewing, Louisville, Ky.	Summer	Summer	Summer
54	A negress, 16 years; by dog, on shoulder. Reported to Jas. Mease, M. D., by J. Shore, M. D., Petersburg, Va.	Sept. 1	Parts excised	Not div.
55	Jas. Remington, 6 years; by dog, on face. By Dr. King, from Thatcher.	Oct. 28	Nov. 7	Nov. 10
56	Levi Woodruff, 43 years; by dog, on ear. From Thatcher.	March 17	April 13	April 15
57	Black boy, 16 years; by dog, on foot. By Dr. Physick, from Thatcher.	March 24	April 28	April 29
58	Son of Col. Swartout; by dog, on arm. By Dr. Borrowe, from Thatcher.	April 11	July 3	July 7
59	Son of Mr. Pylis, 14 years; by cat, on toe. By Dr. Jas. Mease, from Thatcher.	July 14	Nov. 19	Nov. 29
60	J. Opie, 13 years; by dog, on nose and eye. By Dr. J. R. B. Rodgers, from Thatcher.	April 1	July 10	July 15
61	Son of Wm. Todd, 5 years; by dog, on cheek. By Dr. Rush, from Thatcher.	Aug. 6	Sept. 9	Sept. 13
62	Son of Mr. S. Weston, 3 years; 31 wounds by dog. By Dr. Thatcher.	Aug. 16	Nov. 3	Nov. 9
63	Nicholas Lang, 10 years; by dog, not mad, on forearm. By Dr. Jas. M. Newman, Buffalo.	Jan. 5	March 10	March 11
64	A dog, bitten by same dog as above 3 days afterwards. By Dr. Newman.	Jan. 8	March 12	March 12
65	Ezra Sylvester, 73 years; by dog, on finger; same dog as 62. By Thatcher.	Aug. 16	Nov. 14	Nov. 21
66	Mrs. Bush; by cat, on hand. By Thatcher.	Sept. 4	Oct. 19	Oct. 25
67	W. W. Inman; excised on hand.	Sept. 21	Recov'd	
68	Primus, colored; by dog.	Sept. 21	Recov'd	
69	Jack, colored; by dog.	Sept. 21	Recov'd	
70	Smith, colored; by dog.	Sept. 21	Recov'd	
71	Pigs, hogs, horses, cows, and men, bitten same time by same dog. Of the animals bitten, 15 died mad. By Dr. Davis, New Jersey, N. Y. Med. and Phys. Journ., vol. ii.	Sept. 21		
72	Phœbe Powell, 21 years old; by dog, on wrist. Was cauterized, salivated, and paralyzed; 330 grains acetate of lead, and ℥iv of Goulard's tincture administered in 4 days, &c. &c. By C. E. Smith, M. D. Baltimore, N. Y. Med. and Phys. Journ., vol. v.	Jan. 19	Feb. 7	Well
73	Thos. Rodgers, 12 years old; by dog, on wrist. By Dr. Hartshorne, Amer. Journ., Oct. 1848.	June 27	Aug. 17	Aug. 21
74	David Lithgow, 30 years; by dog, on hand. By Dr. Jackson, Amer. Journ., April, 1849.	Feb. 10	March 16	March 18
75	Mrs. Burrows, 30 years; by dog, on wrist; part excised after three months. By Dr. Jackson, Amer. Journ., April, 1849.	July	Oct. 27	Well
76	A carpenter, 35 years; by dog, on thumb. By Dr. Burns, Mass., Amer. Journ., April, 1850.	June	Oct. 28	Oct. 30
77	Charles Baker, 20 years; by dog, on thumb; opii cal. By Dr. Wilson, Amer. Journ., Jan. 1851.	May 24	June 15	Well

Cases of Hydrophobia occurring in the United States—Continued.

CASE.	DESCRIPTION AND AUTHORITY.	BITTEN.	SICKENED.	DIED.
78	J. Jameson, 12 years; by dog, on hand and little finger. By Dr. C. A. Lee, Amer. Journ., Feb. 1837.	April 1	April 29	May 2
79	Marcus Lovell, 4 years; by dog, on cheek. By Dr. C. A. Lee, Amer. Journ., Feb. 1837.	May	July	3d day
80	John McCormick, 44 years; by fox, on hand. By Dr. C. A. Lee, Amer. Journ., Feb. 1837.	March	June	2d day
81	J. Gould, 8 years; by dog, on hand; salivation. By Dr. Hildreth, Med. Repository, vol. vii., 1822.	March 6	March 15	Well
82	Boy, 8 years; by dog, on cheek. By Dr. Griscom, N. Y. Journ. Med., Jan. 1845.	Oct. 8	Nov. 23	Nov. 29
83	A soldier; by dog, on finger. By Dr. G. A. Smith, N. Y. Journ. Med., Sept. 1845.	Fall	6 weeks	2d day
84	John Tyson, 23 years; by dog. By Dr. R. H. Coolidge, N. Y. Journ. Med., Oct. 1839.	June 9	July 27	July 28
85	Boy (Boston), 18 years; by dog. By Dr. A. H. Brown, Boston Med. and Surg. Journ., 1849.	July 29	Nov. 5	Nov. 6
86	Miss Sarah Crehore, 28 years; by dog, on ankle. By J. Perkins, M. D., Castleton, Vt.	Aug. 22	Jan. 16	Jan. 19
87	Wm. Hill, 45 years; by dog, on scrotum. Eclectic Repertory, vol. i.	Oct. 25	Dec. 10	Dec. 11
88	A little boy, 4 years old; by dog, in hand. Boston Med. Journ., June 26, 1850.	May 15	June	June
89	Miss Fulton (Louisiana); by dog. Boston Med. Journ., Sept. 25, 1850.	July 23	Sept. 3	Sept. 4
90	Mr. J. K.; by dog, on leg. Boston Med. Journ., Oct. 1850.	June 13	July 4	Well
91	Child, 3 years old; by cat, on forehead and eye. By Dr. W. B. Gould, Lockport, N. Y.	Nov. 13	Dec. 13	Dec. 17
92	Mr. White, 25 years; no bite, saliva from mad calf. By C. W. Higgins, M. D., Abbington, Ill.	March	March 29	March 31
93	Mr. Clark, 55 years; by cat, on hand. Authority same as above.	Nov. 10	Dec. 10	Dec. 12
94	A horse; assumed inoculation. Authority same.	May 10	June 10	June 12
95	A cow; inoculation assumed. Authority same.	March 5	May 5	May 6
96	Mr. Hoar; by dog, on hand. Boston Med. Journ., 1854.	Feb. 4		April 8
97	Joshua Case, 17 years; on leg, by dog. N. Y. Med. and Phys. Journ., vol. iii. p. 43.	Nov. 8	Nov. 17	Well
98	Girl, 15 years; by dog, on cheek; dog not mad. By R. D. Mussey, M. D., Ohio.		6 weeks	3d day
99	Young man; by dog, on leg or arm. By R. D. Mussey, M. D., Ohio.	July	Feb.	4th day
100	Eliza Frame, 19 years; by dog, on finger. Eclectic Repertory, vol. ix.	June 1	June 28	July 1
101	W. T. Hazlam, 22 years; by dog, on leg. N. Y. Med. and Phys. Journ., 1828.	Feb. 4	Nov. 4	Nov. 4
102	Miss Bassett, 12; by dog, on lip. By J. W. Green, M. D., New York.	April 10	July 7	July 11
103	J. B., laborer, about 30 years; by dog. By J. W. Green, M. D., New York.	March	July	2d day
104	J. Z., 54 years; by dog, on hand. By W. L. Atlee, M. D., Penn.	May	Aug. 30	Sept. 3
105	Robert Ferguson, 28 years; by dog, on finger. By Dr. James P. White, Buffalo Med. Journ., vol. i.	March 15	April 21	April 24
106	Joseph Bell, 35 years; by dog, on thumb. By Dr. Manley, Richfield, Spa.	Oct. 5	June 16	Well

Table showing the month of Inoculation and Commencement of Sickness; also the period of Incubation, and day of Death.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Bitten	11	10	13	6	12	8	8	5	12	6	8	2	101
Sickened	6	5	13	6	4	9	10	5	7	6	12	5	86

Case.	Sick.	Died.	Case.	Sick.	Died.	Case.	Sick.	Died.	Case.	Sick.	Died.
1	42	6th day	27	60	2d day	53			79	60	3d day
2	20	4th "	28	68	3d "	54			80	90	2d "
3	98	4th "	29			55	10	3d day	81	9	Well
4	30	4th "	30			56	27	2d "	82	46	6th "
5	32	2d "	31	34	2d "	57	35	1st "	83	42	2d "
6	30	2d "	32			58	53	4th "	84	48	2d "
7	57	4th "	33			59	128	10th "	85	101	2d "
8	35	2d "	34	71	4th "	60	101	5th "	86	144	3d "
9	31	2d "	35	44	4th "	61	34	4th "	87	42	4th "
10	12	4th "	36	90	3d "	62	79	6th "	88	30	
11	91	4th "	37	154	10th "	63	64	1st "	89	42	2d "
12	365	2d "	38	26	3d "	64	63	1st "	90	21	
13	360	3d "	39	36	4th "	65	90	7th "	91	30	4th "
14	41	4th "	40	120	5th "	66	45	7th "	92	365	2d "
15	41	4th "	41	24	Well	67			93	30	2d "
16	42	1st "	42	65	4th day	68			94	30	2d "
17	14	Well	43	60	4th "	69			95	60	2d "
18			44	50	4th "	70			96	60	4th "
19	32	5th day	45	14		71			97	9	Well
20	89	21st "	46			72	19	Well	98	45	3d day
21	62	4th "	47	60	4th "	73	51	5th day	99	210	4th "
22	49	3d "	48	73	2d "	74	35	3d "	100	27	4th "
23	13	5th "	49	15	3d "	75	90	Well	101	274	1st "
24	90	2d "	50			76	120	4th day	102	90	5th "
25	69	4th "	51			77	22	Well	103	120	2d "
26			52			78	29	4th day	104	90	4th "
									105	36	3d "
									106	249	Well

Recapitulation of the inoculations for the four seasons of the year, as derived, 1st, from the returns in the Report itself; 2d, from those in the *United States Mortality Census;* 3d, from *Tardieu's Report for France;* and 4th, from *Radcliff's Report for England,* making together 246 cases, in which the month of inoculation was ascertained.

	Report.	U. S. census.	France.	England.	Total.
Spring—March, April, May	31	7	10	30	78
Summer—June, July, August	21	7	16	15	59
Autumn—Sept., Oct., Nov.	27	3	4	14	48
Winter—Dec., Jan., Feb.	23	9	10	23	65
	102	26	40	82	250

The average period of incubation in the 89 cases in which it was ascertained was about 70 days, a much longer period than is usually given.

In 23 cases it was		30	days	and	under.	In 3 cases it was		80	days	and	under.
" 11	"	40	"	"		" 8	"	90	"	"	
" 14	"	50	"	"		" 2	"	100	"	"	
" 8	"	60	"	"		" 8	"	200	"	"	
" 6	"	70	"	"		" 6	"	upwards of 200 days.			

The average duration of the disease in the 72 fatal cases in the human subject was three days.

5 died on the 1st day, 20 on the 2d, 12 on the 3d, 27 on the 4th, 6 on the 5th, 3 on the 6th, 2 on the 7th, 2 on the 10th, and 1 on the 21st.

In 89 cases out of 100, the injury was from the bite of the dog. In 9, from that of a cat, and in 1 each from a raccoon and a fox. One supposed from the saliva of a cow, and one from that of a calf.

In 40 instances the injury was upon the hand, in 15 on the face, in 11 on the leg, and in 9 on the arm.

The Committee, in conclusion, would offer the following resolution:—

Resolved, That the Secretary transmit to the Governor of each State a copy of the statistical part of this report, with the respectful request that he would bring the subject before the Legislature of the State over which he presides, that in their wisdom they may devise and adopt a plan by which the evil may be mitigated if not removed.

All which is respectfully submitted.

THOMAS W. BLATCHFORD,
A. D. SPOOR,
Committee.

CASES.

CASE 1. *Hydrophobia from the bite of a Raccoon. Reported by George Russel, M. D., Lincoln, Mass.*

On the 16th of October, 1822, a boy 11 years of age was attacked by a raccoon in the open field, and without any provocation. The animal was immediately killed by two men, whom the cries of the boy summoned to his assistance. The thumb, and skin, and muscles between the thumb and forefinger of the left hand of the lad were much lacerated. The wound was dressed by some one of the family, and was nearly healed on the 42d day after it had been received, when the lad was attacked with wandering pains extending from his hand to his shoulder, neck, and head, and sometimes to his back. These pains were considered by his friends as rheumatic. The next day, he complained of universal distress, a sense of suffocation, and inability to swallow liquids. Domestic remedies were employed, and Dr. Russel did not see the patient till the fourth day of the disease. He had then had no sleep for three nights. Pulse, 100; universal irritability of the system, with a sense of suffocation and stricture of the throat and chest—a continued spitting of a thick, frothy, tenacious saliva—an inability to swallow liquids; an unusual wildness of the eyes, and ferocity of countenance; bowels had not been open for three days; intellect at times deranged, and he manifested a disposition to strike, but not to bite, persons who attended upon him; thirst very great, particularly for water, yet, when it was presented him, he was unable to drink, the mere sight of the water producing immediate convulsions. Opium was administered in large quantities, but without any effect, the symptoms above described becoming more and more aggravated during the day, attended with great prostration of strength; vomiting of a thick, bloody matter; a quick, feeble, and intermitting pulse; coldness of the extremities; tongue very red, but perfectly clear; conjunctivæ red; countenance cadaverous; convulsions almost continued. Death at 1 A. M. of the fifth day. No autopsy.

CASE 2. *Reported by W. E. Coale, M. D., Boston, Mass.*

John Fleming, a hearty full fed boy of seven years, born in England, but living in this country for four years, while on his way to

school one day, threw a stone at a dog which was lying under a wagon, and it flew out and bit him slightly on the knuckle of the little finger of the left hand, *and returned to lie down again.* The wound was dressed very simply, and in a few days was entirely healed. Three weeks after this, on Saturday, Oct. 7th, 1848, the boy was reported as having been "out of sorts" for two or three days; he had also refused to drink water for twenty-four hours. At this time, the throat appeared somewhat swollen, and an active cathartic was prescribed. The next day, he was sitting up; appearance stupid, skin cool, pulse 80. Tongue a little furred. Medicine had acted slightly. Had rested but little, sleep being much disturbed. Some pain at epigastrium, also some headache at times. On being requested to wash his mouth out, he took a tablespoonful of water in his hands, held it about six inches from his mouth, and then suddenly threw it against his teeth with great violence, and swallowed it with a convulsive choking, falling back on the pillow and slightly screaming. Pediluvia and aperients were prescribed, and the patient left. The next day, though his sleep had been much disturbed, he seemed much better, and swallowed with ease, was walking about the room. Tuesday, Oct. 10th, symptoms much more unfavorable; pulse 100, involuntary shivering; lies on back with head thrown back; attempts to swallow water, accompanied with violent spasms, principally opisthotonic; answered questions naturally, but talked wildly when not spoken to; is picking the bedclothes, &c.; bowels had not been moved; an active cathartic was ordered, and a blister to nape of neck. At 2 P. M., he vomited three or four times; at 4 P. M., extremities cold; pulse not to be counted. Countenance expressed great prostration; spasms very frequent and easily excited; mind always wandering, though recalled for a moment; chloroform was administered, but its inhalation appeared to cause so much depression that its use was discontinued; two involuntary dejections; brandy and chloroform were administered every half hour internally, causing spasms, but not as much horror of the fluid. The spasms commenced with a general shiver, and then affected the muscles of the back and extensors. They were not very violent, but consisted simply in stretching the head, neck, and arm out, and stiffening of the trunk; they occurred about once in ten minutes; this state continued till $9\frac{1}{2}$ P. M., when patient had become much weaker; convulsions not so violent; pupils widely dilated; some vomiting of frothy matter; face at times bedewed

with sweat; spasms slight but easily excited, as by fanning him, &c. Death took place at 2 A. M., Oct. 11th.

At the autopsy, all the organs of abdomen and chest were found healthy; right auricle of heart enormously distended with blood; brain healthy; much venous congestion about spinal cord, but nothing else observed.

CASE 3. *Reported by Dr. Curtis, Lowell, Mass.*

W. H. B., a stout healthy young man of 18 years, was bitten, July 29th, 1848, by a strange dog, which immediately made his escape and has not been heard of since. The wound was near the right wrist, was simply dressed and readily healed. On Saturday, Nov. 4th, 1848, he complained of pain in this arm, which was supposed to be rheumatic; this continued without any other symptom till Tuesday at 4 P. M., when he said that water tasted badly, and at 4½ he was unable to swallow it.

At 7½ P. M., countenance anxious; cicatrix of wound somewhat elevated and reddish, not tender; no inflammation of skin about it; some pain in arm at times; stomach nauseated. On being requested to drink, he took the tumbler in his hand and brought it to within half an inch of his mouth, when his head was thrown back spasmodically and his hand forwards. On attempting it again, with much effort he got about a teaspoonful into his mouth, which, as soon as it reached his throat, was attended with the most violent convulsive catchings of his breath, with a sort of sobbing sound. Some milk he was able to swallow with much less difficulty, and he could also swallow bread. Currents of air produced no effect on him at this time. He was put under the influence of chloroform. The next morning every unpleasant symptom had increased. Convulsions were more frequent and violent, but mind rational in intervals; complained of no pain but of a sense of suffocation; great suffering from thirst; occasionally he would discharge from his mouth a viscid and very tenacious saliva, attended with convulsions of the utmost vehemence. The sight of water, or hearing the name of any liquid mentioned, was terrible to him. The sound of fluids in a neighboring apartment, a current of air, or the breath of his attendants agitating the atmosphere near his exposed surface, would produce a like effect.

At 11¼ A. M., he was placed under the influence of chloroform, from which he gradually recovered and the convulsions commenced again. At 4½, anæsthesia was again produced and kept up with a

short interval till 5¾ P. M., when he had sunk so low as to be perfectly quiet. At 6 o'clock the sputa had increased in quantity and become less slimy, and far more frothy. The patient lay quiet, with stertorous breathing, countenance flushed, labored action of the heart, extremities cool, with symptoms of cerebral congestion. The discharge at the mouth also greatly increased and became bloody.

Death occurred at 7¾ P. M., Nov. 8th, without a struggle.

Autopsy, 18 hours after death. Surface of body dark and mottled; extremities nearly black; depending surfaces also very dark; emphysema about the neck, over the thorax, and partly down the upper extremities. Blood, fluid everywhere; no coagula. Spinal cord considerably injected and emphysematous beneath its arachnoid investment. Brain highly injected throughout, and bubbles of air were distinctly seen in its veins. Brain was of normal consistency, ventricles containing their usual amount of fluid. Cut surfaces of cerebral mass exhibited numerous red points. The trachea and bronchia were highly inflamed, and their mucous linings presented a purple colored or violet aspect. Epiglottis very large.

CASE 8. *Reported by Dr. P. Moulton, New Rochelle, N. Y.*

A son of William Craft, deceased, about eight years old, of nervous temperament, and residing in New Rochelle, was bitten slightly on the nose by a strange dog on the 18th day of February, 1842. He was taken ill on the 25th day of March, five weeks after the inoculation, and died on the 27th, forty-eight hours after the attack.

He was visited about two hours after he was bitten, and the bites, which were very superficial, were touched with nit. argenti. He afterwards took sulphur and scutellaria lateriflora for some time, as a prophylactic, as recommended by a Mr. Lewis, formerly of this county. These articles were taken daily up to the period of attack, with the exception of a week or more, when the scutellaria could not be procured.

When I first saw him, after the attack, he had vascular excitement and great restlessness, which I believed might be caused by worms in the alimentary canal. I gave spigelia and senna, which moved his bowels, but gave no relief.

In the evening of the same day, I invited Doctors E. W. Voris and Philip Davenport to attend him with me, as he showed decided symptoms of hydrophobia. It was supposed, by one of these gentlemen, that the symptoms arose from spinal disease, and he sug-

gested the actual cautery along the spine. I went into his room alone, and desired him to try to drink some water out of a glass tumbler, for I knew he drank readily out of a cup, where he did not see the water, remarking to him that he might avoid a painful operation by drinking without agitation, or showing signs of dread on taking the water. He at once consented to drink, and raised himself up in bed to do so; but when he saw the tumbler of water brought near him, he exclaimed "O! not now!" and with great agitation and hurry removed to the far side of the bed, against the wall.

He was directed to take a pill of camphor, assafœtida, and lupulin, or lactucarium, every two hours, if he continued restless.

He took the first pill at 9 o'clock P.M., and rested quietly until near 11. When the second pill was given, he seemed wild, and, for a few minutes, quite frantic; and in this manner he spent the night, having long intervals of quiet rest between his paroxysms.

Finding but little change in his condition in the morning, we agreed to try the effect of cold affusion, as practised by Dr. Arnell, who published a case in the *New York Medical and Physical Journal*, No. 9, 1824, page 43.

We also agreed to give strychnia gr. $\frac{1}{12}$ every two hours, unless it produced some bad effect.

Cold water was poured over him whenever he became much excited, with the effect of calming him, and arresting the fits of jactitation. No perceptible effect was produced by the strychnia; no spasmodic action, nor any other effect usually produced by it, resulted from its use. I was called away, and left him in charge of Dr. Voris, about 2 o'clock P.M., and did not see him again during the day, as a second urgent case called me into a neighboring town; but I rode past the house where he was, about 7 o'clock, and, on inquiry, was informed that he was much better, and that he had just then taken a glass of water into his hand, of which he drank freely, &c. When I returned, in the night, I found him dead. A foam of very thin glistening bubbles was issuing from his mouth. He had been dead six hours.

While I was with him, I noticed signs of nervous excitement most of the time, which was heightened into terror, at times, by the sight of water. At other times he would take a pitcher of water into his hands, put his hand into the water, and pour water from his hand on his head; but it seemed to be done at the expense of painful effort, and he would push the pitcher from him, with signs

of dread, immediately afterwards. At one time he was frightened on seeing a light spot on the wall, produced by solar rays admitted through a crevice in the window shutter, and said: "What fire is that?"

Dr. Voris stated to me, at our next interview, that he gave the strychnia regularly up to the hour of his death, which took place a few minutes after I passed the house, about 7 o'clock; that he had one of his paroxysms about that time, and he had him raised up to receive the cold affusion, when he appeared faint. He was laid down, and a little water was poured on him to remove the faintness, but without having the desired effect, and he died without a struggle, as if from syncope.

It is remarkable that strychnia, in this case, did not produce marked effects. Spasm was not more manifest after than before it was given. We felt justified in giving so large a quantity to this child by the consideration—1st. That the disease was not curable by any means known to us. 2d. That strychnia is a powerful agent, which had not, to our knowledge, been tried in hydrophobia. Query—was this hydrophobia rabiosa? I think it was.

CASE 9. *Reported by Dr. Isaac Casselberry, of Evansville, Indiana.*

Mr. S., aged thirty-five, of sanguine temperament, medium stature, was bitten on the evening of Dec. 16th, 1849, by a dog which at that time was not thought to be rabid. It was fighting the dog of Mr. S. at the time he was bitten. The wound was slight and healed readily, leaving a small hardened cicatrix.

About thirty days afterwards, Mr. S. felt indisposed; but he attributed his indisposition to fatigue and exposure.

During the night, he became much worse, and sent into the city for his physician. The physician visited him early next morning, and found him laboring under the ordinary symptoms of hydrophobia. During the day he was visited by several physicians of the city. His malady rapidly increased; each paroxysm was more protracted in duration, and they were of more frequent occurrence; early the next morning he died.

About one month, therefore, elapsed from the time he was bitten until he manifested indications of being rabid, and he lived about thirty hours after the first seizure.

Mr. S. enjoyed good health previously. The treatment employed was empirical.

CASE 10. *Reported by Dr. Isaac Casselberry, of Evansville, Indiana.*

Master S., aged 9, of nervous temperament, was bitten by a rabid dog about the first of January, 1850. He manifested indications of hydrophobia in twelve days. The symptoms, or rather the disease, gradually progressed. His physician ordered him grain doses of opium, with half grain doses of calomel every three hours. This treatment was continued with but little change for four days, at the end of which time the little patient died. The calomel did not produce the ordinary constitutional effects of that potent agent, nor did it produce any constitutional impression.

The same dog did not bite both persons. But the dog which bit Mr. S. also bit a young man in the same neighborhood, the next day after he bit Mr. S. The young man was badly bitten on the leg, and the wound bled profusely. He has never manifested any indications of the affection.

The city of Evansville is situated on the north bank of the Ohio, in latitude 38°.

Mr. S. resided one mile north of an alluvial district, in which the intermittent form of fever prevails every autumn. He had suffered from this form of fever slightly during the autumn. The lad resided in the city. What are called malarious diseases are not more prevalent in this city than in others on the Ohio, in the same latitude.

CASE 11. *Reported by Washington L. Atlee, M.D., Philadelphia, Pa.*

On Saturday, the 9th Feb., 1839, I was called upon to visit Mrs. Elizabeth Keely. I found my patient to be an intelligent-looking woman, of spare habits, of ordinary stature, and about 34 years old. She told me that she had an attack of rheumatism in her arm, and complained of pain the whole extent of her left arm, particularly in the shoulder. She informed me that she had felt unwell for three or four weeks before, and that on Wednesday previous she had perceived some soreness on the back of the hand, which, continuing to increase, had travelled up to her elbow on Thursday, and, becoming more and more severe, had on Friday reached the shoulder. During the progress of the pain, having received a phial of British oil from a neighbor, she rubbed it on her arm without receiving any relief. She then, of her own accord, applied a blister on the outside of her arm just below the shoulder, with no better success. On Saturday, the pain becoming worse, and advancing into the left side of the neck, and through the arm-

pit into the left breast, she thought it advisable to consult a physician, and I was sent for.

I found the symptoms as above described, with the pain more acute in the joints than in any other part of the arm, taking on the character of the local symptoms of acute rheumatism. Her countenance was somewhat anxious, and her manner a little hurried. The tongue was lightly coated with a yellowish fur; the pulse, skin, and other perceptible functions being natural. I prescribed a blister to be placed on the spine between the shoulders, and four cathartic pills, composed of submur. hydrar., aloe socotor., convol. jalap., stalagm. cambog., sapo. castil., to be taken immediately. Upon taking leave of her, I directed her to send me word in the morning if she was not better, or sooner if she became worse.

On Sunday morning, the 10th inst., word came that she was no better. At 9½ o'clock A. M., I visited her, and was informed by her husband that she had passed a bad night. Shortly after she had retired to bed, she was aroused by a sense of suffocation, and tightness of the chest, with pain in the præcordia, or at the lower part of the breast-bone. After this she could not sleep. Every few minutes throughout the night she would suddenly start up with a wild and anxious countenance, a sensation of smothering, and with feelings of great distress. On attempting to drink, she discovered that she could not swallow, and that every attempt excited spasms in her throat, and aggravated these distressful symptoms. Her peculiar situation alarmed Mr. Keely very much, and he was on the point of starting for me several times in the night, but, through fear of causing too much trouble, he did not inform me until morning. At the time I was there, she had become rather more calm and easy, though I observed occasionally a slight spasmodic action of her throat, and some hurry of speech. She picked up a bottle of spirits of camphor off the stove and smelt it, and immediately she was seized with slight spasms of the chest and neck. On repeating it, the same results followed, when she gave the bottle to her little daughter, telling her to take it away. There was a wildness and an impatience depicted in her countenance during these spells totally different from anything I had ever observed in other spasmodic affections. Even after these spasms were off, she had an expression of anxiety, and complained of great pain and soreness of the præcordia, and weight on her breast, with an inability to swallow anything. The most distressing symptom was the pain

in the præcordia. The blister had drawn well, but, instead of being placed over the spine, it had been applied midway between the shoulder and spine; and the pills had operated freely. Her tongue was still coated with a yellowish fur, and her pulse free from excitement. The pain in the arm was entirely gone, excepting a little uneasiness she experienced in the shoulder.

It was during this visit that I was first informed that she had been bitten by a mad dog. She then resided in Philadelphia, and while walking along the street a dog rushed out and bit her in the back of the left arm, causing an extensive lacerated wound extending down to the sinews. After going home she returned to the place where she received the injury to ascertain the condition of the dog, and discovered that he had been chained up for mad, and had just broken loose as she was passing by, and bit her and several others, and that he had afterwards been killed. She immediately consulted Dr. Pennypacker, of Philadelphia, who ordered her to soak the wound in salt water, and afterwards to apply to it a salt poultice. This was on Saturday the 3d of November last. On Monday following she called on Dr. George McClellan, who was not at home. On her way home she called at the house of a friend, who advised her to employ Stoy's cure. They informed her that about eighteen years before two of their children had been bitten by a mad dog, and the attack of hydrophobia was prevented by taking Stoy's medicine. They procured the medicine for her, and she went through a full and regular course of it, commencing on that day. The medicine had the effect of producing copious vomiting on the two first days that she took it, but not afterwards. Shortly after adopting these precautionary measures, the family removed to Lancaster; since their removal to this place, she enjoyed good health until about three or four weeks ago, from which time, until the period of her attack, she said she "was not very well." The wound had healed up well, but the scar always remained tender and livid, and she frequently felt a numbness in her arm accompanied by a sensation best understood by the term "asleep."

After giving me this history of herself, she said she did not believe her present sickness proceeded from the bite of the dog. Knowing the powerful influence that the mind exerts upon disease of this character, I encouraged her in this idea, and was careful, in directing my inquiries to her, to avoid exciting in her any suspicion that I believed it. Although apprehensive of the nature of her disease, and strongly desirous of employing certain means of con-

firming my opinion, I cautiously avoided everything that would lead her mind to a different result. I think, however, that, although she openly discarded the idea that her illness proceeded from the bite of the dog, her manner disclosed that she secretly believed that to be the cause. I prescribed a combination of submur. hydrar., pulver. ipecac., āā grs. v., to be taken every two hours.

Upon my way home I met my brother, Dr. John L. Atlee, and told him my fears respecting my patient, requesting him to hold himself in readiness to visit her in company with me, in case I was more fully convinced of the character of the disease upon my next visit.

At one o'clock P. M. of the same day, I visited her again. She received me tranquilly, and expressed herself glad to see me. Her symptoms were now more distressing than they were before. She had a more wild and anxious look; her breathing was accompanied with a short convulsive sobbing inspiration; and the spasms of the chest and throat were more violent, and came on spontaneously every few minutes. There was no febrile excitement. Her tongue, pulse, and skin continued the same. I examined the wound particularly. It still retained its livid appearance, but it was entirely free from tenderness. She had taken one dose only of the medicine, and that with the greatest pain and difficulty, and accompanied with violent spasm. She said it almost choked her when she attempted to swallow it. A short time after she had taken this powder, sickness of the stomach came on, and she vomited three or four successive times, ejecting a quantity of slime. During the last act of vomiting from this powder, she threw off a considerable portion of blood. In consequence of the distress and difficulty produced by taking this first powder, she had desisted from the attempt of taking any more, although she said she felt relieved after she had vomited. Her attention was now directed to her power of swallowing. She said she could not swallow. In reply to my several queries, she observed that she could not explain the reason of her difficulty to swallow; her throat was not sore; *she could not say that she had any dread of fluids;* she was willing and desirous of taking them; yet, whenever she attempted it, she was seized with an intense sense of smothering and spasm of the throat which she could not control. Upon expressing my desire that she should overcome this spasmodic action of the throat by a strong effort of her mind, she replied, "Well, Doctor, I will try." She then took a cup containing a little toast-water off the stove, and,

clearing out her throat, she prepared herself for drinking. I now watched her with the most intense anxiety. She carried the cup half way up to her mouth, then stopped. Her countenance at this time was most peculiar and indescribable. Her features were set, fixed. It appeared as if the energies of her mind were concentrating themselves for some dreadful effort. She carried the cup near to her mouth, then stopped again. I could observe, on her fixed and determined countenance, a commingling of much excitement and alarm. *I could there read the unconquerable dread of a fluid.* She put the cup to her lips—and at once the horrors of hydrophobia burst upon me. I shudder even now at the recital—but it cannot be described—it must be seen. The cup had no sooner touched her lips than she was thrown into violent spasms. First, a sudden, quick, convulsive inspiration, accompanied by a noise as if the air was drawn forcibly through a very narrow chink, violent contraction of the muscles of the neck and face, and drawing up of the shoulders and breast, and great retraction of the pit of the stomach and abdomen. The skin of the throat in front of the larynx was corrugated by spasm. Her countenance expressed the greatest anxiety and distress, and her body was thrown forward by the spasmodic action. This dreadful agony lasted about half a minute. As soon as it was over, she said: "Doctor, I will try it again." Precisely the same scene followed. Again she tried it, and succeeded in getting about a teaspoonful in her mouth. Now making two or three efforts at deglutition without avail, with one desperate effort she swallowed it.

It must be at once perceived that my patient was a woman of extraordinary resolution and firmness, and knowing this, I urged her to take her powders regularly in spite of the difficulty. She said, "Doctor, I suffer very much from the attempt; but I will take them." Her husband remarked to me that he believed her illness proceeded from the bite of the dog. She replied, "No; it's rheumatism; I'll soon be better of the spasms." Although she seemed unwilling to permit her mind to believe it, yet I think she was perfectly conscious of the truth of her husband's opinion.

After ordering a continuance of the medicine already prescribed, and the application of a large blister along the course of the spine, commencing at the nape of the neck, I left her.

At 3½ o'clock P. M., I visited her in consultation with my brother, Dr. John L. Atlee. The introduction of my brother produced no unusual agitation. She appeared glad to see us, and was quite

observant of the common courtesies of life, getting up and offering us chairs, and requesting us to be seated. She had taken another powder, but with great difficulty. This was succeeded by vomiting a large quantity of yellowish-green slime, and some blood, which entirely relieved her of the pain in the præcordia. Since the vomiting had ceased, there had been no recurrence of the spasms, unless she attempted to drink, and then they were less violent. She expressed herself much better, and perfectly free from pain. The stricture and weight on her chest diminished, and there was less anxiety of the countenance. No febrile excitement—pulse in an upright position was 84; in a recumbent posture, 72 in the minute. The fauces or throat was free from irritation, except a narrow stripe of red on the edge of the right palatine arch, which appeared more like mere engorgement of the capillary vessels than inflammation. She had no soreness or pain in the throat. There was some tenderness, particularly during spasm, in both sides of the neck immediately below the mastoid process. There was no tonic rigidity of the muscles of the neck as occurs in tetanus or lock-jaw, and even during the paroxysms of spasm, the tension was confined to the respiratory muscles. We offered her different kinds of drink, all of which were followed by spasms, less violent, however, than before. Cold drink caused stronger spasms than warm did. In consequence of the blister having been applied much lower down than had been ordered, and with a view, also, of extending the decorticated surfaces for the purpose of introducing medicines into the system by means of the endermic practice, we ordered another blister over the back of the neck. Applied 1 gr. of acetate of morphia sprinkled on simple cerate to the blister on the shoulder blade. After administering another powder, which she swallowed with less difficulty, we left her.

At 6 o'clock P. M. information was received that she was no worse.

At 8½ o'clock P. M. we saw her again. The change for the better was quite evident on our first entering the room. Both she and her husband expressed their gratification at her manifest improvement. She had had no spontaneous spasms since our last visit, excepting one, and that came on while lying down. I would observe here that there was always a much stronger tendency to spasms when in a recumbent posture. Her spirits were much improved, and her countenance less anxious. The spasms caused by drinking were much lighter. There was no pain in the præcordia,

and the skin was soft and moist, and pulse 90. The powder we had administered at our last visit produced vomiting of the same kind of fluid without blood. She had taken another dose of it, about an hour before, which had not been followed by vomiting. She said she felt drowsy, and thought she could sleep. On handing her a piece of toast and requesting her to eat, she took a small bite, chewed it and swallowed it with tolerable ease, and repeated it two or three times. Observing that it was rather dry, we offered her a drink, but as soon as she placed it to her mouth, the spasms supervened, though less violent than before. Toast soaked in water could also be eaten in small bits without spasms. She tried to drink repeatedly, and succeeded in getting a little down, and it was always attended with spasm. Noticing that the spasm commenced just at the moment she attempted to draw in the drink into her mouth, we suggested to her another plan: to open her mouth wide, permit us to lay a teaspoon filled with water full in her mouth, then close her lips and refrain from sucking it out of the spoon. Having done this, and then emptying the spoon by inverting it, it was followed by a much lighter spasm than when drank from a cup. In drinking with a quill also, her spasms were weaker. It appeared as if the wetting of the lips and the effort of sucking in the fluid favored the production of the spasm. Ordered the blister to be dressed with basilicon ointment, and prescribed Submur. hydrar. grs. x; Pulv. ipecac. grs. iiss.

On Monday, February 11th, 8 o'clock A. M., I visited her alone. She informed me that she had altogether during the night about one hour's unsound sleep, and more in the early part of the evening than afterwards. She was not able to drink all night, she could not swallow, and thinks her spasms, on attempting to drink, were stronger and of longer continuance. She endeavored to get down some drink by soaking it up with toast, but she could not. During the night, two spasms came on spontaneously while lying down. She said she was very bad early this morning; she experienced feelings of intense distress, and was thrown into spasms whenever the door was opened and admitted the cold air; felt her spirits give way, and her thirst was extreme. At this time she felt the spasms working in her, every four or five minutes, although they did not break out, producing great agony. She continued in this way until she made several desperate efforts to drink some warm coffee, which she succeeded in forcing into her by means of a quill, to the amount of nearly half a pint. This was the largest quantity of

fluid she had taken since the spasms commenced, and it had quite a tranquillizing effect upon her, causing the great anxiety and distress to diminish. After this she washed her face with a camphor rag, and while doing it was affected with spasm. Although she expressed herself much better than she had been earlier in the morning, I noticed more anxiety and wildness in her countenance than the evening before. Her pulse was not quite so full, the skin rather below the natural temperature, the tongue more thickly coated with the same kind of fur, the breathing seemed rather more difficult, and was interrupted by peculiar sobs and deep sighs. While I was there, she picked up a cold handkerchief to wipe her mouth, and it brought on spasm as soon as it touched her face. She had taken two powders after we had left her last night, which produced vomiting of a yellowish, bitter and frothy fluid, and some blood; but she postponed taking any more after 12 o'clock in the night, in consequence of the great difficulty she experienced in swallowing them, and the sickness they produced, although she admitted that she was always relieved after vomiting. The blisters had drawn well; the cuticle being raised throughout their whole extent. I gave her another powder rubbed up in sugar, which, with the aid of coffee and the quill, she succeeded in getting down, not, however, without considerable difficulty.

At 11 o'clock A. M. visited her with my brother. Her skin was of the natural temperature and moisture, pulse fuller, tongue the same, and countenance less anxious. She had had no spontaneous spasms since; they still came on, however, on every attempt to drink. She complained that the heat of the stove sickened her, but she could not bear the doors open. On attempting to drink some coffee with a quill, she was thrown into a violent spasm, and succeeded in swallowing only a little. The powder which I had given her at my last visit caused her to throw off the same kind of fluid, and a living lumbricus. We examined the blister that had been dressed yesterday by the morphia, and the morphia appeared to be absorbed. The fresh blistered surface on the neck was now dressed with acetate of morphia, and, upon applying the cerate cold to the blister, it produced a paroxysm. Her bowels not having been moved since Saturday, we prescribed, in the form of pill, Oleum tiglii, gtt. ij, every hour until the desired effect would be produced.

At 3 o'clock P. M. visited her in company with Dr. E. Parry. Her symptoms were about the same; pulse 88. She had taken

only two doses of the oil, and without effect. Gave her another dose, which she swallowed with difficulty. When taking some tea after it, she was thrown into severe spasms, and said she *did not like to see drink come near her.* Uniformly in taking drink she would hesitate, as before described, several times before she would place the cup to her lips, and as soon as she attempted to suck in the fluid, the spasms would commence. She had got into a doze about an hour before, and was awakened by her son suddenly entering the room, which produced a violent paroxysm. Applied morphia again to a blistered surface.

At 6 o'clock P. M., received word that she was no better, and that the medicine had not operated.

At 8 o'clock P. M., called again, with my brother and Mr. Landis, a student. Her pulse was 90; skin and countenance the same. The lower gums and the sides of the tongue appeared excited, resembling the mercurial blush, but it was not attended with the coppery taste and mercurial odor. She had had several very severe spasms from cool air coming over her face, and also from her attempts to drink. She got a most violent spasm when the family were at supper, caused by the noise of pouring out tea. This spasm raised her off her seat, and was accompanied with a peculiar spasmodic noise, great horror of countenance, and a throwing of the hands about. We now spread 30 grs. of submur. hydrar. on a small piece of bread, part of which she ate without difficulty, complaining of it being very dry. We offered her drink, but she did not appear to want the cup; she took the quill out of the drink, and hastily drew the wetted end through her mouth, thus catching a drop. This was followed by light spasm. We then advised her to dip the bread in tea to moisten it, but she did not seem inclined to do it. Observing her dread of the fluid, I dipped it in for her, when she ate it. She said she had dozed a little, and she thought she could doze more through the night. She had taken since the last visit two doses more of the oleum tiglii, making in all 10 gtt., without any effect. Prescribed submur. hydrarg. grs. xv, pulv. ipecac. grs. iij, to be taken every three hours during the night.

On Tuesday, February 12th, at one o'clock A. M., I was called up by a messenger, telling me that Mrs. Keely was much worse, and that I should hurry over. When I arrived there, Mr. Keely informed me that, while he was lying dozing on a chair, she alarmed him very much by suddenly starting up, and flying across the room, with wildness and impatience, towards the front door. He asked

her what was the matter, and she replied she wished to lock the door, and then as suddenly rushed towards the back door. Mr. Keely said that, for a considerable time before this came on her, she had been engaged in prayer, and in hearing the Bible read, according to her request, and that she expressed herself sensible of her situation, and was anxious to prepare herself for the final result. Before my arrival, and immediately after that spell, she had several spasms more violent than at any time before. She had taken one of the powders with great difficulty, and in attempting to take another, it brought on very severe paroxysms, accompanied with ejectio urinæ. When the spasms became so violent, she requested her husband to tie her, no doubt fearing that in those moments of intense agony she might injure some one. When I arrived, her children were in the room with her. She said that before she got so bad she had felt extremely happy, and had her children called up around her, that she "felt as if she could go," and spoke a long time to her children and husband, as one taking an everlasting farewell. She told me she felt so much composed when her mind was engaged in such reflections, and desired that the Bible might be read again. I asked her whether I should read it for her, and she assenting, I inquired what portion of the Scripture she preferred. She replied: "The 52d chapter of Isaiah." I read that chapter slowly and distinctly for her, and when done, inquired if I should read on. She said: "I am afraid of tiring you; but I would like to hear more." I then continued, and read eight or nine of the succeeding chapters, asking her, at the end of every chapter, whether I should read on. I then observed that perhaps there were other portions of Scripture she would like to have read. She replied: "You are too kind; but if you are not tired, I should like you to read of the sufferings and death of our Saviour." I then turned over to Matthew and read for her. During all this time, she remained perfectly composed and tranquil, although her spasms had been so violent before. Shortly after this, my brother arrived. Upon asking her to let us see her tongue, she became greatly agitated; her countenance became wild and suspicious; and with appearance of great dread, she said "she could not bear the candle." She was sitting with her back turned towards the candle, but she observed my brother reaching for it, and, although the candle was not touched, instantly she was thrown into the most violent paroxysm I had yet seen. Her head was thrown about from side to side in dreadful anguish, and fearing that she might injure those who were holding

her, I placed my hand upon her head to secure her, but her agony was very much increased, and she earnestly called out: "Take off your hand! take off your hand!" My brother remained until 3 o'clock, at which time we gave her pulv. ipecac. grs. xx, acetate of morphia, gr. ss.

She hesitated for a long time before she took it, saying, "I can take no more," and while preparing to give it to her, she appeared violently agitated, and was seized with incessant spasmodic sobbings. She at last consented to try it, but would not have it moistened; it was mixed up with dry sugar, and she took it, and succeeded in swallowing it with great difficulty, but without much spasm. I remained with her until 4 o'clock, and during this time she had several very severe paroxysms. They sometimes would come on spontaneously; others would be excited by walking through the room, and agitating the air. Her dread of fluids was so great that no drink was offered to her. During these paroxysms, which lasted from half to a whole minute, the inspirations and expirations were quick and spasmodic, producing a singular sound by the concussion of the sudden ingress and egress of air, which, to a warm and prepossessed imagination, might seem to be a kind of barking. This no doubt has given rise to the vulgar idea that a barking like that of a dog is one of the symptoms of hydrophobia. The spasm generally commenced with a sudden, forcible, and spasmodic *spitting*, very quickly repeated, resembling very much the spitting of an irritated cat, and ended with a deep inspiration or sigh. She frequently had very sudden convulsive sobbing inspirations, sometimes only one, at others two or three in rapid succession, and both in these and in the spasms, her countenance would get much more wild and anxious. Her skin was moist, pulse rather quicker, and she complained more of the heat of the room. Prescribed a powder like the last, to be given every two hours.

Before I took my leave of her this morning, she seemed desirous of knowing my opinion of the result of her case. I told her that her disease was one of a very fatal character, but that we were not entirely without hope; that, in consequence of the manifest amendment that had occurred in her symptoms, we had good cause for encouragement; and that, if her constitution was good and the treatment persevered in, the disease might probably wear itself out, and the system afterwards be restored to health. She replied, she hoped that it might be so, but she expected a different result. I informed her that it was impossible for us to tell, at the present stage of her

case, how her disease would terminate, yet, as there was great uncertainty, it would be better for her to prepare for the worst, and then, in any event, she would be safe. She assented to what I said, and observed that she was not fully prepared to leave this world, and felt desirous of conversing with some person concerning the salvation of her soul; she said that, if her mind was fully prepared, she was sure that in her moments of ease between the spasms, she would feel resigned, and consoled with the idea that when she left this world of pain she would be happy in the other. Upon asking her whether she would like to receive the visits of a clergyman, she replied, "Oh! yes, I would be much pleased; but I am a stranger, and know no clergyman." I assured her that would make no difference; that either of them would call to see her with pleasure; and as she said that she belonged to the Presbyterian Church in Philadelphia, I would request the Rev. Mr. Davie to see her.

During this conversation, she was quite calm and collected, and free from spasms.

Before going home, I left two more powders like the last, to be taken two hours apart.

At 8 o'clock A. M., Mr. Keely called and stated that the powder we had given her at 3 o'clock sickened her very much and produced some drowsiness, but no sleep. The other powders she found it impossible to take.

At 9½ o'clock A. M., visited her again with my brother and Messrs. Landis and Maxwell, medical students. She had taken one powder this morning in her husband's absence. She was pretty much in the same situation as when we last left her, though she said she was worse, and the spasms stronger. The spasms appeared as if they were becoming more general, and they were now always accompanied with that peculiar noise. There was yet no tonic or tetanic rigidity of the muscles. The action of the heart was rather strong, and stronger than was indicated by the pulse at the wrist. Prescribed a blister to the præcordia.

At 11 o'clock A. M., I called upon the Rev. Mr. Davie and requested him to accompany me to see Mrs. Keely. At the time we entered her room, the spasms were very strong, and she was suffering much agony when I introduced Mr. Davie to her. Her paroxysms were now more violent and frequent than before, accompanied with intense anxiety and horror of countenance, spasmodic noise, and an urgent desire for air, calling on those in the room to open the doors. During the spasms she requested those who held

her to press strongly on the pit of the stomach. She complained of thirst, and desired to have something with which she could moisten her mouth. She asked for coffee, but, as it approached her, she was seized with strong spasms; by repeated efforts, however, she drew in a little through a quill, and succeeded in swallowing it. Her respiration was frequently interrupted with convulsive sobs, and she was often hawking up, and spitting out, as if phlegm was always collecting in her throat. She found it very difficult to speak, not appearing to have full control over the organs of speech; it appeared as if the attempt at speaking produced a spasmodic restlessness of the articulating muscles, which rendered it painful for her to speak. Becoming a little more composed, she apologized to Mr. Davie for not being able to converse with him, but said she was glad to see him. He was engaged with her in conversation and prayer about half an hour, which had a most tranquillizing effect upon her. During the whole of this period she was remarkably calm, and free from spasm, although her paroxysms before and immediately after were frequent and of the most violent character. It would appear, from this circumstance, as if the exercise of the mind in this disease had some mysterious connection with the production of spasm; for, as the paroxysms were entirely suspended while the mind was engaged in this all-absorbing question, and as they recurred so soon as the mind was not thus exercised, it would indicate almost as close a relation as cause and effect. The members of the profession will at once observe the correspondence between this circumstance in this case, and a distinguishing feature of chorea, viz: the act of volition being necessary to the convulsive movements.

In consequence of the frequent occurrence of spasm, the blister was not applied to the præcordia. She, this morning, again requested to be tied; but as we found that she could be managed with safety, we considered it unnecessary and forbade it. Before leaving her, I applied more morphia to the blistered surface.

At 2 o'clock P. M., called to see her again, with my brother. Her paroxysms had been frequent and strong since our last visit. She inquired of us whether bleeding would not weaken her, as if she desired it to shorten her existence. She said her "feelings were awful; no one knew, and wished it was over." She lamented about her children and husband—"that was her only trouble," and desired us to comfort Mr. Keely. We attempted to give her another powder, composed of submur. hydr., grs. xxx, pulv. ipecac., grs. v,

spread on bread. She ate about half of it, and after having chewed it for a considerable time, she attempted to swallow it, but could not, saying it was so dry that she could not get it to the right place to swallow it. Persevering, however, with very strong efforts, she succeeded in getting some down, and it was followed by a most violent paroxysm, raising her up on her feet, and producing, in the violence of the struggle, the most wild and despairing expression of countenance. During mastication, the tongue was frequently and suddenly protruded, appearing covered with a darker coat; and her lips became encrusted with a dark-colored matter. There was incessant hawking up of the phlegm which collected in her throat, and spitting of it about the room. She complained of great dryness of the mouth, but would not moisten it; and strongly opposed the administration of more medicines, seeming to dread them. Talking was more and more difficult, and was interrupted by spasms of the throat, and convulsive sobbings. Pulse 100. Prescribed oleum cajeputi, drachms ij, pulv. opii, drachm i, to be mixed and rubbed in around the neck and breast.

At 6 o'clock P. M., visited with Dr. Hopkins and Mr. Landis. Found her in a state of very great nervous excitement, her manner wild and hurried; would startle at the least noise or motion; had great dread of candlelight, and the snuffing of the candle produced great agitation; incessant hawking, and vehement efforts to spit out the frothy phlegm; and her face was turned away from those who sat in front of her, as if she dreaded the brilliancy of their eyes, or the effect of their breath on her face, which produced spasm. When the spasms came on her, she would call furiously for air—for the doors to be open. Delirium appeared to be approaching. She said that Mr. Davie had been there in the afternoon, and she had been much comforted, and that she now was "willing and ready to go." In consequence of the vapor of the oleum cajeputi exciting spasm, it was discontinued.

At 8 o'clock P. M., saw her again, with my brother, Drs. Hopkins and Kerfoot, and Messrs. Landis and Maxwell. We entered the room with great caution and the utmost quietness, and although her back was turned towards the door, and a large quilt, hung up, intervened, she was instantly sensible of the increased number in the room, and was greatly agitated in consequence of it. The nervous excitement and restlessness were extreme, her countenance was marked with great horror and dread, and whenever she was the least startled, it was characterized by unutterable anguish and terror.

There was considerable delirium; the mind was wandering and unsteady, ideas incoherent, and she was much more talkative. She referred several times to the mad dog—"Yes, it was the dog;" "I know it was the mad dog." And she would say: "Come, Mr. Keely, let's take a walk—let's go to the door—let's go down stairs, Mr. Keely—let's go to bed—let's go home," and so on in a wild and impatient strain. We talked to her about bleeding her, and, without replying to us, she said wildly: "Shall I, Mr. Keely? You think I should, Mr. Keely?" She appeared to think that we were going to injure her. There was a constant hawking and spitting, and her face was turned down, and away from us. She said she could not look any person in the face. While in this highly excited state, she said to her husband: "Mr. Keely, I want you to look me right in the face." Her face being turned downwards, and from him, he hesitated. Again she said: "Look me in the face, Mr. Keely." He leaned over to look her in the face, and, as soon as their eyes met, there was a simultaneous and frightful expression of horror—the wild anguish and terror in her countenance seemed to startle Mr. Keely, and he turned his head aside with strong marks of horror depicted upon his. All in the room appeared to feel the shock. We now succeeded in administering two grains of muriate of morphia, and also applied it over the blistered surface on the neck. Observing, heretofore, the tranquillizing effect which always followed the taking of drink, we urged her to try and swallow some coffee. She made repeated efforts, with persevering firmness, until she accomplished her object, which was followed by a considerable amendment of her symptoms. She drank more and more until she got down altogether about half a teacupful. In proportion as she took her drink, her wild, nervous, and delirious state subsided. She could now bear the full glare of the candle, and motion through the room produced much less disturbance. The hawking diminished, and there appeared to be an improvement in all her symptoms. Expecting that the large dose of morphia she had taken might produce a desire for sleep, we made a bed for her on the floor, and, after seating her on it, she appeared more composed and rational. After this, we offered her more drink. She took the cup, leaned over it, carrying her mouth towards the opposite side, and suddenly, to our great surprise, *lapped* up a mouthful with her tongue. This was followed by very little spasm. Her pulse was 115. After remaining with her until 10 o'clock P. M., and prescribing two grs.

of muriate of morphia, every three hours, we left her in a much more composed state of mind and body than we found her.

During our visit this evening, we proposed to her the operation of tracheotomy, but this was peremptorily refused by her husband. So far back in my professional life as I can recollect of being able to form any opinion of this most horrible disease, I have always thought that this operation would be of invaluable benefit, and I had come to the determination of carrying it into effect the first opportunity that offered. This opinion is now firmly established by all the phenomena of this unfortunate case. Although the probability is that the rapidity of the muscular exhaustion, which supervened upon this visit, would have rendered the operation in this instance and at this stage of the disease, useless, yet I am fully convinced that, if resorted to early in the attack, it would strip hydrophobia of its greatest horrors, if it did not cure it. I would demand it upon myself, if I should be thus afflicted. The spasms of the glottis, the constriction of the chest, the difficulty of deglutition, the sense of suffocation, and the intense anxiety and distress, would, in my opinion, vanish, and the administration of medicines and the taking of drink would be rendered comparatively easy. The operation is a simple one, and worthy of a trial. The horrid and incurable character of hydrophobia demands the experiment.

On Wednesday morning the 13th inst., at 7 o'clock A. M., I visited her alone. I was informed that she had about one hour's repose shortly after we left her last night, but the phlegm collecting in her throat had awakened her, and she continued awake during the remainder of the night. She took another two grain dose of morphia about 11 o'clock P. M., and remained tolerably composed until between 2 and 3 o'clock this morning. At 3 o'clock A. M. she took another powder of morphia, but this did not tranquillize her, and she continued to get worse until I saw her. During the night she had swallowed three or four cups of coffee. I found her exceedingly nervous, and nearly constantly in a state of wild delirium, and there was added to the whole look an appearance of horror and despair exceeding anything I had seen either in mania or any other kind of delirium. She looked wildly and suspiciously at every one entering her apartment, and believed that those around her wished to poison her, and kill her, and spoke about the operation. She was very talkative, her thoughts run wild, passing from one subject to another, sometimes serious and at other times sportive and humorous. She spoke also a great deal about her children,

and had a strong suspicion that "all was not right with them." She would wildly cry out, "Where's my children?" "Why don't Manasseh come?" "Where's Jackson?" "Where's Louisa?" "Bring them to me." "Ah! Keely! I knew it! I knew it!" "See, there hangs Louisa's apron." "Where's Jackson's shoes? all's not right with them." "Ah! Keely, I knew it!" Again she would break out: "Bring me my children, Keely! and if they kill me, let them be killed too, for I will not leave them here to be knocked about by strangers." She wanted to go home—to go down stairs—to dress and take a walk—and accused them of throwing handfuls of fur and black stuff in her face, and said that the fur was sticking in her mouth yet. She got up several times on her feet, but would sink down again from weakness and exhaustion. Once she suddenly started up and rushed through the kitchen door, but was immediately caught, and she sank down from the exertion. She succeeded in swallowing a little coffee, but was exceedingly suspicious of everything offered to her, and would examine it over and over again, before taking it. She complained of the air being loaded with fur, and of it coming into her face. The hawking was still frequent, and she spit out a great deal of the frothy mucus. Her pulse was small, weak, and frequent, between 130 and 140 in a minute, and her extremities cold. I observed that her bed had been much stained by the renal secretions during the night. Before leaving her I administered another two grain dose of muriate of morphia, which after a short time was spit out again imbedded in the froth.

At 9½ o'clock A. M., called with my brother and Messrs. Landis and Maxwell. We met the Rev. Mr. Davie there. He informed us that he had not been able to fix her attention. Her mind was exceedingly wandering and delirious, and very much as it had been at my last visit. She was rapidly sinking, her hands and feet and face were cold, pulse scarcely perceptible, and the action of the heart very feeble. There were no paroxysms of suffocation, some spasmodic twitching, and copious expectoration of froth. We now gave her, at repeated intervals, about three ounces of wine, which had no stimulating effect. There now appeared to be a general relaxation of the muscular system, extending to the coats of the intestines—shifting of wind, and borborygmus, followed by copious and frequent alvine discharges—the first that had occurred since the spasms had commenced. Her children were now brought in to see her. She looked at them awhile and said, "Take them away;

take them away." About 11½ o'clock A. M., she had the last symptoms of a spasm, which, though not violent, harassed her a good deal. She now drank a little more wine, and then I laid her down upon the pillow, after which she never moved. From this period on to the moment of her death, the phenomena of her case were singularly peculiar. Her body having been placed in an inclined position, her head was thrown back with her face directly upwards. Her mouth and eyes were open. There was not the least motion or disturbance of her countenance, no more action in her bowels, her pulse was lost, and there was not a muscle or a fibre seen to move, excepting those of respiration. The whole body and countenance seemed as passive as in death, and respiration was more like a mechanical than a vital action. She appeared as dead, and was only disturbed by the ingress and egress of air through the larynx. The depth of the inspirations became less and less, until at last they were lost in the larynx. The breathing was clear; there was no *rattle* in the throat indicating the collection of mucus in the air-vessels. This peculiar kind of respiration continued without interruption for about one hour, accompanied, at every expiration, with a very low moaning sound. The breathing now stopped, and all thought her dead; but in a few moments it commenced again, and went on as before. Again it stopped, and again commenced, and so on for 27 successive times, continuing until 1 o'clock P. M., when we looked for its return, but in vain. The moment of dissolution was not indicated by any of the usual evidences of the separation of soul and body. She appeared to experience nothing of the agonies of death. Before, at the time of, and after death, her appearance was precisely the same, and, at the intervals of suspended respiration, life could not be distinguished.

Throughout the whole course of the disease, after the spasmodic symptoms commenced, this unfortunate woman could not bear, except for a moment, a recumbent position. She sat on a chair the most of the time, and after the paroxysms became violent, was secured by a person sitting in front of her having hold of her wrists. There was not the least appearance of danger of her biting any person near her; nor among the variety of motions which she made was there any which looked like attempting to snap or bite at anything within her reach; and they who were about her had no apprehension of her doing so.

I have now concluded this most interesting case, and I have gone perhaps more minutely into its details than was required.

But as you desired a particular account of the case, I was anxious to give you a faithful history of it from beginning to end. This I was fully enabled to do, in consequence of taking notes of the case immediately after every visit. I am not conscious of having made one misstatement, either as respects her symptoms or treatment, or as regards the history of her own case as given to us by herself. All as it came to my knowledge, and in a conscious spirit of candor, is now before the public and profession, and if the latter can discover anything in the treatment or recommendations that can be avoided or adopted to the benefit of the community I shall rejoice in the discovery. It is most ardently desired that the profession will be soon able to say to their suffering patients, in the language of the 52d chapter of Isaiah, "Loose thyself from *the bonds of thy neck*, O captive daughter of Zion."

CASE 16. *Reported by Dr. Traill Green, Easton, Pa.*

But one case of hydrophobia has occurred in this vicinity in the human species. Dr. E. Slough, of South Easton, who has furnished the information, attended the patient, a girl aged 6 years.

Period of inoculation, March 12, 1848; attack April 23.

Six weeks elapsed between the inoculation and attack. On the 22d of April there was much fever. Hydrophobic symptoms appeared towards morning on the 23d, and death occurred towards evening on the same day.

It was supposed, Dr. Slough informs me, that the termination of the case was hastened by the use of chloroform by inhalation.

CASE 17. *Reported by Dr. Samuel Hart, Brooklyn, L. I.*

The minutes of this case have been mislaid; but I find data which I regard as rendering it nearly conclusive that the case occurred in June, 1831.

My first visit to Mrs. S., about fifty years old, was late in the afternoon, and she presented the following appearances: she was sitting in a chair, her mind clear, rather composed, but her countenance expressive of great anxiety; she complained of alternate chills and heats, though slight, and the pulse was small and feeble, and but slightly accelerated; upon the inner side of the right forefinger, near its extremity, she exhibited a scratch, which that morning had become painful, the pain extending up the arm; and the throat was somewhat affected, but deglutition not materially interrupted. The scratch upon the finger had nearly healed, but that

day had opened again, and was much inflamed. It had not been troublesome, and she had not been interrupted in consequence of it from her usual domestic employments.

Upon investigating the cause of this (to me unusual) development, I was startled by the following statement: A favorite dog was drooping and seemed sick for two or three days, with a constant flow of saliva from his mouth, accompanied with great distress, and an utter inability to swallow either liquids or solids, notwithstanding he made frequent violent and apparently spasmodic efforts to do so. Fearing the animal would perish for want of food, he was confined, his mouth held open, and Mrs. S. (her hand being small) thrust a quantity of food into the œsophagus, which passed into the stomach; in withdrawing her hand, she received the scratch above mentioned from one of his teeth. In a little time, I think the same day, the dog disappeared, and was never seen by the family afterwards.

No suspicions were entertained that the dog was rabid, and Mrs. S. had not experienced any solicitude in consequence of this, to her mind, very trifling and inconsiderable wound.

As nearly as I can now ascertain, it was the fourteenth day after the above events occurred that I was first called.

With these antecedents, and the symptoms before me, I could not doubt I had to contend with a most formidable and alarming disease. Experience had uniformly demonstrated the complete uncertainty of remedial agents in hydrophobia, and I approached the treatment with anxious forebodings. Recollecting a case in my father's hands arrested by mercury, and one successfully treated with the same remedy by the late Dr. Willoughly, I was led to adopt it in this case. The submuriate combined with opium was administered in as large quantities, and as frequently repeated as the system would retain, and saturnine poultices with laudanum were applied to the wounded finger, but afforded no relief. In forty-eight hours the specific effects of the calomel began to manifest themselves upon the glands, and the pain and all the unpleasant symptoms were mitigated. The ptyalism continued some ten days, when my patient became convalescent, and perfectly recovered.

CASE 18. *Reported by Dr. Samuel Hart, Brooklyn, L. I.*

I met with a rabid dog, in the town of Oswego, which had bitten several animals; all of them, I believe, died rabid.

In 1847 or 1848, I had several interviews with the late Dr. Drake

of Cincinnati, and at one of them, he inquired whether hydrophobia was frequent among us? I related the case of Mrs. S. He regarded it unequivocally a decided case of the above disease.

CASE 19. *Reported by Thos. Turner, M. D., Brooklyn, N. Y.*

Cornelius Wurges, a German, æt. 22, was admitted to the hospital Saturday evening, December 17, 1855. He had been bitten by a dog at the extremity of the thumb of the left hand on the 12th of November last. According to his statement, the teeth of the animal had not broken the skin, but had caused some blood, which he pressed out, to collect under the nail; the dog was tied up for two days and then let go, and it is not known whether he had rabies or not. The patient was taken ill on the Tuesday previous to admission with chills and vomiting. Dr. Andrews, of East New York, was sent for. At first he supposed it to be a case of commencing remittent fever, but discovered that the man could not drink or eat, and when he attempted to do so, he was seized with spasms. At first he denied having been bitten, but at last admitted it when questioned closely. I first saw him on Saturday afternoon in company with Drs. Ingraham and Andrews; he was walking about the room supported on each side by an assistant; his limbs tottered under him, and appeared weak. He was quite talkative, face slightly flushed, tongue coated, pulse 120 and weak. Under the nail on which he had been bitten was a blue mark, such as is left after a bruise, and the whole thumb was hot and a little swollen. He complained of pain on the bend of the arm at the elbow and in the lateral region of the thorax on both sides. He made several attempts to drink some milk, but gave it up as impossible. When brought to the hospital, he expressed himself as feeling better, and drank a spoonful of tea, but no sooner had it touched the pharynx than he sprang up from the bed and gasped for breath. He explained the difficulty by saying that his tongue had swelled, but nothing more than a greater amount of redness about the fauces could be observed on looking into his mouth. He complained of the pain when pressure was made on the larynx, or on the side of the neck on a level with the angle of the lower jaw. The back was blistered by applying for 12 minutes two strips of muslin 18 inches long by 2½ inches wide, spread with vesicating ammoniacal ointment, leaving about one inch of the median line clear, and extending from the nape of the neck downwards.

The vesicated surface was dressed with an ointment containing

gr. j morph. sulph. He was quiet until 9 o'clock, when he became very violent, requiring three strong men to hold him. He appeared suspicious and afraid the nurses intended to harm him, cried out that they were going to murder him, and shouted, at the top of his voice, "Watch! mad dog! mad dog!" While struggling with his keepers, he seized one of them by the arm with his teeth, making an abrasion of the cuticle, and they stated that through the night he made several attempts to bite them. It was found necessary to tie his feet together, and confine him to the bed by passing a sheet over his chest and fastened to the bedstead on each side. He continued in an excited state throughout the night, and up to 7 o'clock in the morning. On Sunday morning he was quiet but much weaker, evidently failing rapidly. His pulse varied from 130 to 150. The conjunctivæ were injected, and the eyes had a glassy expression. His face and body were covered with a profuse perspiration, and the feet were cold. He said the fingers of the left hand felt stiff, and the hands looked blue as they do in some cases where the circulation is obstructed. He complained of pain at the epigastrium. When raised in bed, he spat out some tough white mucus. He was so sensitive to currents of air on his face, that the breath of those standing several feet from him brought on spasms, and he cursed them for throwing things at him. No other part of the surface was very sensitive when touched or blown upon. Some beer was brought to him at his request, and he tried to drink it, but was unable to get it to his lips. There seemed to be some regularity in the occurrence of the spasms, coming on every half minute. Chloroform by inhalation was tried with the idea that it would allay the spasmodic action; but he died about 12 M. before it could be determined whether the administration of it would have been beneficial or not. At the *post-mortem* all the organs appeared healthy with the exception of the spinal cord, the papillæ at the base of the tongue, and congestion about the fauces and epiglottis. From examination of the part bitten after death, it appeared most probable that the dog's tooth or teeth had passed under the nail.

CASE 21. *Reported by Dr. Geo. N. Burwell, Buffalo, N. Y.*

Mrs. Willard was bitten by a cat. She was seized with hydrophobia about seven weeks afterwards, and died. One symptom was very prominent during the last day's illness, viz: an uncontrollable disposition to loud, rapid, and incessant talking; she would stop for nothing; not to listen to any of us; she was a very

pious woman, and, although glad to see her minister, she would not or could not stop this talking for a moment, even while he was praying by her bedside. On being asked why she did so, she said she should choke to death instantly if she stopped it. It appeared to me that it was necessary to secure *free expiration;* she had no difficulty in making the inspirations, but she evidently felt that there would be no expiration without the articulation.

CASE 22. *Reported by Dr. Geo. N. Burwell, Buffalo, N. Y.*

On July 4th, 1854, I went to Hamburg, ten miles out, to visit Mr. Gould, a farmer 59 years of age, laboring under hydrophobia, having already had it two days. He had been bitten on the arm by a strange dog, May 16, previous. What became of the dog no one ever knew; it was a stranger in the neighborhood; he was already having frequent spasms when I saw him. Despairing of all the ordinary remedies, I tried that of opening the trachea as recommended by Dr. Marshall Hall, but without benefiting the patient. In this case the first sign of a returning paroxysm was a hissing sound through the wound, *during the expiration of the patient*, suggesting the idea of a spasmodic closure of the rima glottidis.

It was only while reflecting on the case, after I had left the patient, that I first drew the inference, from the facts mentioned in the two cases, that a paroxysm in hydrophobia affected, hindered, or impeded the expiratory act of respiration rather than the inspiratory.

Not having seen any cases since, I have not been able to verify or disprove this observation, and do not therefore yet claim it as a true one. I thought I would state it to you, begging you to inform me if it be an old observation (I have not been able to find any such statement in any of the treatises on the subject I have been able to examine), and if new, whether there is anything in the cases you have collected which would go either to refute or confirm it.

CASE 23. *Reported by F. H. Peckham, Providence, R. I.*

Joseph Mallette, residing in Mallette St., Providence, R. I., was bitten Feb. 19th, 1853, by his own dog. The dog was not supposed to be rabid at the time of biting him, nor is there positive proof that he was afterwards, though circumstances go strongly to show that he was. The dog was a small house dog, a mixture of the cur and poodle.

At the time of biting his master, he was suffering from wounds which he had received from fighting with other dogs, the day previous. As he was naturally cross and snappish, his master did not think it strange that he should bite him, as he was bathing his wounds, and might have hurt him. The dog had been severely bitten two or three weeks previous, but had nearly recovered from those wounds. The day previous to biting his master and to being himself bitten, Mrs. Mallette noticed that while this dog was playing with the cat, as he was wont to do, and always seemed very fond of her, and was never known before to bite her, that he suddenly became enraged, and bit her quite severely.

They had two other cats which were bitten by this dog; all of which were killed after Mallette's death. It was much to be regretted that the lives of the cats had not been spared, to see if hydrophobia would have been developed. The dog disappeared the day after biting his master, and was not seen till some days after his death, when he was found dead under one of the neighbor's outsheds, where he had probably lain for some time. Mallette was a Frenchman by birth, of a bilious sanguine temperament, aged 47 years. He was strong and athletic, with remarkable muscular development. He had always been accustomed to the most active and laborious life, and had almost uninterrupted good health up to the time he was bitten. The bite was a very slight one, it was on the inside of the upper lip, about midway; the mucous membrane was only grazed off, so that there was but a slight oozing of blood. Mallette was unable to determine whether this was done by his own tooth or the dog's; as the dog's nose struck his lip when he snapped at him. The injury was so slight that nothing was thought of it at the time. In about eight or ten days after this, he felt a slight soreness and stiffness of the upper lip. This in a short time passed away, and he was well till March the 4th, when he complained of what he termed a "severe cold." He did not leave off his occupation (a truckman) till the 5th. On the 6th, his "cold" was so bad as to confine him to the house.

He had at this time headache, pain in his back, and chills. In the afternoon of this day, the 6th, he had paroxysms of sneezing, with profuse discharge from the eyes and nose. The sneezing was so violent as to create some anxiety, and lasted throughout the night. His wife administered a dose of castor oil, put his feet into warm water, and afterwards applied mustard poultices. The

sneezing stopped in the morning, but he would now unconsciously draw a long sigh, and sob like a person suffering from deep grief.

On the 7th, after the sneezing had subsided, and the catarrhal symptoms had disappeared, the sobbing and sighing continued at intervals from thirty minutes to an hour.

In addition to these, he began to complain of a fulness of the stomach, with a sensation, every now and then, as though all the internal viscera were rising up.

This feeling of rising, or "lifting up," as he termed it, was very annoying and distressing to him. On this day (the 7th), at 9 o'clock A. M., he first experienced a difficulty in swallowing. At first he did not think much of it, and was not in the least suspicious of the terrible malady he was about to be afflicted with. His wife says that, when she saw he had the difficulty or inability to swallow, the thought came over her that it might possibly be hydrophobia, though she did not at that time mention it to him. About 11 o'clock, he made another attempt to drink, but found he could not. There was, at this time, in addition to the difficulty of deglutition, a sort of spasmodic or convulsive action pervading the whole system, whenever there was an attempt to carry liquids to the mouth. The arm was particularly affected, and, as it were, thrown away from the mouth by some uncontrollable power, whenever an attempt was made to carry it there with drinks.

This created some alarm, and they thought they would call their family physician, Dr. Geo. Capron, who was my partner.

His wife, now being more apprehensive than ever that the disease would prove to be what she had feared, inquired of him, previous to Dr. Capron's arrival, if he thought the bite of his dog had anything to do with his sickness. He replied no, as he saw the dog drink water after biting him. And she says she distinctly remembers seeing the dog drink after biting him. She said they were both of the opinion that a rabid dog could not drink water, and both, having seen the dog drink after biting him, were greatly consoled, and their fears quieted by this belief. Dr. Capron visited him between 12 and 1 o'clock of the 7th, and received the foregoing history of his case. The Dr. said he found him calm, without fever, free from pain, and with a pulse about natural. He greeted the Dr. cordially, and laughingly remarked there was nothing the matter with him, except he could not drink. The doctor spoke encouragingly, and said he would see him try. A tumbler of water being brought, he made the most determined and deliberative efforts

to drink, but was unable to do so, owing to the spasms affecting his arm so that he could not bring the tumbler to his mouth. At this time there was no discharge or increase of saliva.

The doctor spoke hopefully to him, and prescribed a warm pediluvium, with mustard poultices, as warm as he could bear them, to be applied to his feet and stomach; the last with a view to relieve the sensation of "rising up," which distressed him very much, and seemed to increase. He also prescribed a teaspoonful of the pulverized skullcap (scutellaria lateriflora), to be taken in molasses. (This herb at one time enjoyed considerable reputation as a medicine in hydrophobia. From extensive use in our practice, we have found it a very useful nervine and tonic.)

At 7½ P. M., Dr. Capron and myself visited him again. Dr. C. had related the case to me, and his strong conviction that it would prove to be a genuine case of hydrophobia. On our arrival, we found the doctor's directions had been faithfully carried into effect. The skullcap he had swallowed in molasses, but it was with the greatest difficulty. The foot-bath at first excited him very much, but in a little while it wore off, and he seemed more quiet under its influence.

He had not been able to swallow any water, though he had repeatedly made the attempt. His physical condition was much the same as when Dr. C. first saw him. He was free from thirst, which, he pleasantly remarked, was very fortunate for him. There was no mental excitement perceptible; neither was there of the pulse; no unusual heat of the skin or drowsiness, though he had not slept since the night of the 4th. We had him try to swallow some water, with a view to test his ability, and to observe the effect that would be manifested. He made the most resolute and determined effort, but it was all to no purpose. No sooner had he taken the water into his hand than he began to tremble, and the whole nervous system seemed agitated with a slight convulsive action throughout the muscular system.

During this time he was mentally calm and appeared perfectly rational. I do not think I ever saw one more calm and self-possessed. There was nothing evinced that showed he was mentally nervous or fidgety. As the water was brought to him in a glass, I did not know but the sight of it might have some influence, and I suggested his trying to swallow some water from a spoon put in his mouth by another individual. To this he readily assented. I took a spoonful of water, and put it to his mouth. It produced consider-

able convulsive action, but he finally succeeded in getting his mouth open so that I could empty it in.

With almost superhuman efforts on his part, and the most emphatic encouragement on mine, he succeeded in swallowing some. It was, however, not without considerable choking, and a sense of suffocation.

This was the last water he ever swallowed. It distressed him very much, and whenever the subject of drinking water was mentioned after this, he seemed wild and delirious. It would cause him to shudder and tremble, with the appearance of terror or fright.

We advised him to continue the scutellaria, as he had been taking it, and in addition two grains of the extract of belladonna, every two hours, alternating with the skullcap, till he should sleep. The mustard poultices were discontinued, as they seemed to distress him. He began now to be sensitive to moving bodies around him, and especially if they were coming towards him.

In addition to the above, we advised chloroform liniment, with frictions to the spine. He took the belladonna through the night. This he could, in the form of a pill, chew and get down.

The scutellaria had to be discontinued early in the evening from inability to swallow it. He slept none through the night, but talked deliriously about waters being forced down him, and that he should resist all such attempts, and that he would have satisfaction should the trial be made again.

He would continue to sob, and seemed at times depressed, as though he had lost self-control. On the morning of the 8th, he seemed calm, and much physically as he was the day previous.

He said he was desirous to make his will; that he felt sensible he could not get well. A magistrate was sent for, and he made his will—calmly, and with the most deliberate composure, exhibiting no excitement or delirium.

Once during the night of the 7th, his wife said, in talking about his inability to drink, he desired her to carry the light out of the room, and bring him some water, that perhaps in the dark he might be able to take it. This she did, but it made no difference; whenever water was brought in the vicinity of him, it invariably produced a sort of spasm, with a sense of suffocation and wildness that he could not control. After the night of the 7th, he made no further attempt to swallow water. After making his will on the 8th, he seemed somewhat exhausted and unable to discharge the saliva from his mouth, or to swallow it.

His mouth soon became filled with a viscid mucus, and the periods of sobbing and depression became more frequent and of longer duration.

He continued to take the belladonna till 12 o'clock of the 8th. He seemed no better, but rather grew worse.

The belladonna had not the least effect, though he must have taken at least 17 grains. At this time (12 o'clock of the 8th), he refused to take anything, saying there was no relief for him till he was in his box (meaning coffin).

Dr. C. proposed the use of chloroform to quiet him, and if possible to procure sleep. He consented to the trial of it, but no sooner did the doctor take it from his pocket than he saw it, and was thrown into a fearful paroxysm of excitement and delirium. He ran to a bureau to obtain a pistol he had there, and declared he would shoot the doctor should he attempt to force water down him again. The doctor said he seemed so wild and furious that he felt almost afraid he might do some violence.

From the effect the sight of the chloroform had on him, he took a great dislike to the doctor, and would not see him afterwards. Through the afternoon of the 8th he was wild, and raved about those who were "bent," as he said, "upon destroying him with water."

It was only upon this subject that he seemed to talk much. When he did converse upon other subjects, he seemed calm and rational; his flesh was cool, pulse about one hundred. His countenance began to exhibit the effects of the constant watchfulness, and plainly showed that he was failing. The mouth was filled with viscid mucus, which ran out of the sides. The difficulty of spitting commenced on the 7th, and lasted till he died.

Through the afternoon of the 8th and till 11 o'clock A. M. of the 9th, there was no marked change in his case, except early in the morning of the 9th he had what his attendants thought to be two slight convulsions; these almost instantly passed off. He died easily, and apparently without much suffering, on the 9th, about 11 o'clock A. M.

His death seemed to occur from exhaustion, and complete prostration of the nervous system. He slept none from the night of the 4th till he died, a period of about one hundred and forty hours. He drank no fluids or ate anything from the 5th, a period of nearly one hundred and twenty hours.

He had no movement from his bowels after the operation of the oil on the 6th. The secretion of urine during the time was nearly natural, both as to appearance and quantity.

He was bitten on the 19th Feb. 1853; the disease manifested itself fully on March the 6th following, being fifteen days after he was bitten. He lived about nineteen days from the time he was bitten, and about three after the disease was fully developed.

CASE 24. *Reported by Dr. Stephen C. Griggs, Providence, R. Island.*

On the 22d day of July last (1853), a dog belonging to Mr. Henry Hopkins, a waiter, aged 28 years, became quarrelsome, and bit another dog. Mr. Hopkins tied him up, and punished him, when the dog bit his master through the little finger. This excited no alarm, as he supposed the animal simply irritated at being taken from the other dog. On the 24th, he unloosed it, and although he tried to coax it back, it immediately passed down the street, paying not the slightest attention to the calls of its master. Since that time he has not seen or heard of the dog. Up to the 24th, he had had no suspicion but the animal was in perfect health. The dog that was bitten on the 22d died at the end of two weeks. It first became paralyzed in one of its fore legs; then in the other fore leg; and soon after in its hind legs; then its jaws became paralyzed, and soon after it died. I cannot ascertain that it showed the usual signs of hydrophobia.

After his dog ran away so unceremoniously, Mr. Hopkins became alarmed, fearing the animal might have been mad. (His finger had been dressed simply as an ordinary wound.) He now read several works on hydrophobia, and tried some prophylactic treatment. After waiting three months, he dismissed his fears as groundless, and came to visit some friends in Killingly, Ct. On Friday, Oct. 21, during the day, he felt a slight uneasiness in the throat, as if something was there he should throw off. The sensation was so slight that he did not mention it. He rested well that night till 4 in the morning, when he was suddenly attacked by vomiting. Said "he was not sick at the stomach, but there was *something* in his throat which every few minutes made him heave." He continued so through the day. At about 4 in the afternoon they sent for me. I was not at home, and Dr. Hutchens went.

Himself and friends now feared hydrophobia. Dr. Hutchens did not encourage this belief. He gave of croton oil four drops; applied a blister to the arm; a mustard paste to the stomach.

At this time he refused drinks, as they produced a *sensation* of *suffocation*.

I first saw him at 12, midnight. He was sitting up on a sofa, supported by two of his friends, and occasionally leaning back on pillows piled up behind him. He was now fully conscious of his situation, but perfectly calm. His face flushed and anxious; his breathing was a continual sighing, with an occasional gasp for breath; very like a person who is wading down into cold water. Pulse 120, hard. Hands covered with perspiration and cold. At this time the *sight* of liquids would produce the suffocating spasm. The spittoon could not be brought near his face. The spasm also would be brought on by anything coming near or in contact with his face. The smallest lock of his hair falling down over his face, or any attempt to apply a handkerchief to his nose, would produce it. There were constant efforts to clear his throat of a thick stringy mucus. Almost every minute there was an effort to vomit. He could not swallow without the utmost difficulty. By great efforts he succeeded in swallowing two teaspoonfuls of cold water. Said it made his stomach feel better; it was soon rejected. The same with some gruel. The suffocating spasms were increasing with fearful rapidity. Up to this time he had not complained of pain in any part of his body. There was no pain or unpleasant sensation in the bitten finger; no headache. When asked if he suffered from pain, he said "no:" he was easy, except this frightful sense of suffocation.

Treatment.—Not knowing what to do, I did nothing.

At 7 o'clock, Sunday morning, all his symptoms had increased in severity. There was much difficulty in understanding him, his words were so broken up by his sighing and spasms. At 10 o'clock the spasms had become so intense that it took two men to control him. He appeared perfectly conscious, but had no control over himself during the spasm. At his request the attempt was now made to steam him. But the spasms increased in severity till 2 o'clock P. M., when he died from exhaustion, in the interval between the spasms.

To sum up: he was bitten on the 22d of July, complained of no unpleasant symptoms till Oct. 22, at 4 o'clock A. M., when he was attacked by vomiting, and died on the 23d, at 2 o'clock P. M., just 34 hours from the attack, and three months from the inoculation.

The dog was a large bulldog. Nervous temperament.

CASE 25. *Reported by Thomas F. Cullen, M. D., Camden, N. J.*

On Saturday, Sept. 8, 1855, the wife of John White, aged 50 years, came to my office at 3 o'clock A. M., and desired advice for her husband, who was "sick." Upon inquiry, found that he complained of having pains in his bones, back, neck, and head, weight in the epigastrium, was feverish and thirsty, but could not swallow without some difficulty, and that he had been troubled with a slight diarrhœa for two or three days. He had attended to his business (as slip tender) at Walnut Street wharf until 11 o'clock the preceding night, when he came home. Such was the account I gathered from his wife.

Knowing that his occupation exposed him to sudden atmospheric changes, as well that his residence was on the marshy shores of the Delaware, and also that he had had an attack of intermittent fever six weeks previous, I ordered him to take hyd. chlo. mit. gr. viij, to be followed in three hours by ol. ricini ℥j, and promised to see him in the morning.

Saw patient at 7 A. M.; found his pulse and skin nearly natural; tongue much furred; pain in shoulders, back, head, and breast; considerable difficulty of breathing; thirst, and a disinclination to swallow, as he said it "hurt and choked him." His breathing was so peculiar, and countenance so anxious, that I feared congestion of the lungs, or some serious lesion of the thoracic viscera; consequently I examined by percussion and auscultation, and found everything normal, except that there seemed to be somewhat more vigorous and laborious action of the heart than the pulse at wrist indicated.

Ordered sinapisms to be applied to chest, and ext. senna f℥ss, as the bowels had not been moved.

12 M. Bowels had been freely moved; discharges dark, glairy, and bilious; pulse natural; skin moist and relaxed. Breathing more natural, interrupted at times, however, by a slight, hurried, dry, and smothered cough, during the supervention of which there was considerable restlessness, and a tossing to and fro in the bed; when the tongue was protruded (to do which required a strong effort of the will), it was thrust out of the mouth with the volocity of a serpent's, and drawn back very suddenly, the teeth closing in a measure on it. Endeavored to examine the fauces, but this he positively refused to submit to, as he insisted that it would choke him. He had drank some water during the morning, but found a considerable difficulty in swallowing it, as well as the medicine, or any other

liquid. At my request he drank some water, when he seized the glass eagerly, gulped down two or three swallows, handed the glass hurriedly to me, and was seized with a paroxysm of coughing, with restless tossings to and fro, ending highly excited. Made inquiries as to his having received any injuries at any time lately, and was told both by himself and wife that he had received none; made an examination and found no traces of anything of the kind. As his feet and lower extremities were somewhat cool, ordered the application of dry heat, and as he was nervous and restless, and his mind highly excited, objecting strongly to medicines, directed that his room be kept dark, and perfectly quiet, and promised to see him at six in the evening; at which time found his skin hot and dry, tongue more furred, pulse 80 per minute, same difficulty in protruding tongue. Bowels had been moved during the afternoon, pains in shoulder and chest, respiration hurried, and very much interrupted with cough of the character spoken of before. Mind very much excited; expressed fears that he would never recover. Made further inquiries as to his having been hurt, and was still answered in the negative. Ordered sinapisms to chest to be reapplied, and pulv. Doveri gr. x to be given every hour until quiet or sleep was induced.

10 o'clock P. M. Had taken pulv. Doveri gr. xx; seemed more quiet and disposed to sleep, yet at times there was some nervous agitation. Directed a continuance of pulv. Doveri if restless, and tinct. assafœtid. and spt. æth. sulph. comp. āā ℥j. M. Sig.—A teaspoonful every hour or two as necessary.

9th (7 o'clock A. M.) Rested tolerably well during the night; had several hours of sleep, interrupted at times by restlessness and difficulty of breathing. There was considerable jactitation and nervous twitchings, especially in the arms, difficulty in swallowing, countenance sardonic, great fear of death expressed by patient. Asked his wife if he had ever been bitten by any animal. (The question was not put to him on account of his extreme mental dejection, fearing its operation on his mind.) His wife said that he had not. Inquired of other members of the family, and could not hear of any bite having been inflicted.

As every symptom pointed out the disease to be hydrophobia as described, and having never seen a case, I called in consultation Dr. J. S. Mulford, whose experience in that disease I knew to be considerable; and upon our visiting the patient together at noon on that day, and pursuing our inquiries, the patient informed us that

he had been bitten by a cat on Walnut St. wharf about ten weeks before. He was able to designate the time by an accident that happened in his son-in-law's family which I attended, and upon referring to my daybook, I found that the accident occurred seventy-two days prior to the first symptoms exhibited by the patient. The bite was received the evening before the accident.

White stated "that whilst eating his supper he saw a strange cat running on the wharf. He called the cat to him and offered it a piece of cake; the cat came to him and instead of taking the cake bit his finger, and ran away; he never to his knowledge saw the cat afterwards." Showed two scars on forefinger of right hand, also a small dark spot on nail of same finger where the tooth had penetrated.

At this time (12 M. on the 9th) there was an increase in violence of all the symptoms. The answers to the questions of Dr. M. were given in the shortest and most crabbed manner, in fact, some questions he doggedly refused to answer at all. Complained of an increase of pain in chest—the pain about back and shoulders was entirely relieved—pulse 100 per minute. Respiration difficult—tongue protruded with less difficulty, and in a more natural manner.

A slight draught of air being directed accidentally upon the patient, produced convulsive action of the whole system, and peculiar spasmodic action about the glottis, followed by a cough, and a sudden and violent spitting of a thick tenacious saliva, which was secreted in great quantities. The discharge of this saliva occurred every few seconds. Upon being asked to drink some water, he refused in a loud tone, and with a very angry manner. Directed tinct. aconit. rad. gtt. iii, with chloroform, gtt. xxx, every three hours.

After Dr. M. had left the house, White sent for me to come up to his room, when he told me that he had just swallowed two tablespoonfuls of water, and apologized to me in a very humble way for his abrupt manner to Dr. M. and myself. At my request, he swallowed another tablespoonful of water, which was accomplished with great effort, the patient sitting up in bed, anxious and agitated, and saying in a quick and hurried manner, "I'm ready; I'm ready; Quick! quick!" gulping convulsively when the spoon was put in his mouth, and falling back in a spasm upon the bed, tearing at his throat with his fingers, endeavoring, as it were, to force the

water down, by drawing his hands down the outside of his throat, from his chin to the pomum Adami.

6 o'clock P. M. Dr. Mulford and W. S. Bishop, U. S. N., saw the case with me. All symptoms aggravated, eye bright and glaring in expression, pupil much dilated, pulse 150 per minute. Respiration 44 per minute. Experienced great difficulty in speaking, and begged that we would not ask him any questions; skin flaccid and moist; continued spitting of tenacious saliva, which was ejected with much force. Had taken but one dose of aconite and chloroform, but had swallowed some thin arrowroot gruel. Directed blister to nape of neck, intending to apply morph. sulph. to denuded surface. Tinct. aconit. gtt. x, and chloroform ʒiss in starch water, every 3 hours as an injection.

9 o'clock P. M. Great aggravation of all symptoms. Immense quantities of saliva had been discharged, and at times there was vomiting of dark-green glairy matter. He was perfectly furious, and very abusive to all his friends, and to myself in particular, and entertained the idea that we wished to murder and rob him—threatened terrible vengeance if he ever recovered. Had positively refused to have the injection given, the bare mention of which excited him to the highest pitch of fury.

Tried the inhalation of æth. sulph. three parts, to one part chloroform; which he resisted with terrible threats, which were sometimes changed to pleadings that I would let him "alone to sleep, and come in the morning when he was *rested*."

Upon reasoning with him, and assuring him that the inhalation would produce the sleep he so much wished for, he would consent to allow its application, but the moment the sponge was brought near him he became frenzied, and endeavored to injure those about him; accordingly, he was secured in such a way that he was perfectly under control. At this time his pulse was 152 per minute, very feeble and irregular. Soon after ether was applied, he became calm; pulse fuller. After remaining quiet for a few moments, the convulsions returned, which were easily controlled by the application of the ether for a few seconds.

The blister on the nape of the neck having been torn off by the patient, and it being inconvenient to replace it, it was applied to the epigastrium. Gave injection as ordered before, and directed its repetition every three hours, also ether by inhalation, only when convulsions returned with violence. Remained until one o'clock A. M., up to which time he was quiet. Pulse 152 per

minute, very feeble and irregular; skin cool, flaccid, and moist; evidently sinking. About one hour after I left him he died, having had only slight tendency to spasms, which were not of a sufficiently severe character to demand etherization.

The patient had only been *ill* sixty one hours, although during the afternoon and evening of the 8th he complained of feeling unwell, but not sufficiently so, as he thought, to warrant his leaving his work.

The short duration of the attack can only be attributed to want of vital force in the patient. He was thin, cadaverous, and decidedly of a scrofulous diathesis, and had in early life suffered severely from white swelling.

A constitution so depraved could not long resist any powerful malady, much less one so terrible as is hydrophobia.

CASE 26. *Reported by Mr. J. Sanders, Cloverport, Ky.*

Sir: I just now noticed a call in the *Louisville Journal*, for information in relation to any case of hydrophobia that may have come under the observation of any physician or other person, to be sent you as early as possible. I am no physician, but several cases of hydrophobia having come under my observation some years past, perhaps I can contribute a mite towards your "philanthropic object."

In the fall of 1839, I was a resident of Spencer County, Indiana; it was I believe about Sept. 20th a "mad dog," traversing the neighborhood, in one night did an immense amount of mischief, by biting hogs and cattle, and other dogs. The animals bitten were attacked in a short time afterwards with the terrible disease; though not exactly in "nine days," yet none were attacked sooner than that period; the disease delaying to exhibit itself in some of these animals for three or four weeks. Of the hogs, their general actions after the attack was that of intoxication, no disposition to change place, yet in continual motion, turning about, taking a step or two forward, and then back again; the head never in its natural position but elevated, and turned a little to one side, white froth about the mouth, no inclination to do any damage; their attention could be drawn in no way. Of the hogs attacked I saw several, they all acted *precisely* alike. Of the cattle I saw only one, a large fat cow; she seemed to be in the greatest pain; no disposition to change place, yet in continual motion; a white froth at the mouth, occasionally bellowing; no raising of the head high as in the case of

the hogs, but giving the head and neck the position the cow kind exhibits when about making battle. This cow frequently fell to the ground, but would immediately rise again. If any one approached her, she would make at him as if for an attack, but would fall immediately to the ground, rise again, not renewing the attack as it were for that time.

How long these animals would have continued in this state I cannot tell, for they were all shot soon after they were attacked. In these lines I have been as brief as possible; if there is anything else you wish to inquire about as being characteristic of this dreadful malady, write to me, and if I can refresh my memory sufficiently, I will give you the information with pleasure. The most remarkable feature in regard to the swine was elevating the head and turning it a little to one side. In the case of the cattle, falling to the ground whenever they advanced a step or two toward any person for attack. The cattle seemed as though they would do injury if they could; but the hogs showed no such symptoms. A small boy was bitten by this dog some miles from my residence, and died soon after in dreadful agony. I did not see the case, and can give no information about it as to how he was affected, how long after the bite before the attack, or how long after the attack before death. If this will be of any use to you in your report, you are very welcome to it. I am yours, very respectfully.

CASE 28. *Reported by Dr. C. F. Clark, Woodbury, N. J.*

On Tuesday, the 16th day of May, 1854, I was called to see a Mr. Isaac Murphy, near this place. He was a stout rugged-looking man, aged 25 years, a farmer by profession. I found him walking about the yard with his sister; he had a wild unnatural look, but was perfectly rational; he told me he was taken unwell on the previous Thursday; he had been bitten on the hand and wrist just 10 weeks previously, by a small Scotch terrier dog, brought home on that day by his mother-in-law, Mrs. Driver, from Philadelphia; no one imagining, at that time, the dog to be rabid, although Mrs. D. was told that this dog was an ill-natured cur, snapping at everything that came in his way; he eventually escaped, and was found fighting with the dog of a neighbor, who shot him, still without any suspicion of hydrophobia.

Mr. Murphy's first symptom on Tuesday was in the cicatrix of the wound on the wrist, which began to swell and pain him. Being at work in a meadow, he took up portions of cold mud and applied to

it, with temporary relief of the unpleasant feeling; on Friday the same unpleasant feeling extended to the arm, and next day to the side of the neck and head, and to the opposite arm; this unpleasent feeling gradually grew more intense, preventing him from sleeping. On Tuesday morning he found some difficulty in swallowing his coffee; this difficulty he attributed to having drank pretty largely of sharp vinegar on Saturday and Sunday, which, he said, had made his throat sore. I proposed examining his throat, and brought him in front of the window, to seat him for the purpose, when he immediately started back, as though the light hurt his eyes, and with a peculiar catching of the breath, such as would be induced by throwing a handful of cold water, unexpectedly, into a person's face. I found the lining membrane of the fauces red and somewhat swollen, the tonsils were not enlarged, the uvula slightly enlarged, the velum a little thickened, and the posterior wall of the pharynx highly vascular. His pulse was quick and full, beating about 100; his eyes were bright and glassy, having a peculiar wild look, such as I have noticed in a rabid horse, which I had seen some months before. The cicatrix was elevated above the surface, red and painful. I immediately cut it out, although I think now this was altogether unnecessary. I applied a blister over the part, gave him a purge of jalap and calomel, and advised him to drink as much brandy as he could, intending, if possible, to intoxicate. He was a temperance man, and objected, on this account, to taking so much brandy, and, besides, he had great difficulty in getting at it, as he expressed himself; while bringing the glass or a cup of liquid to his mouth, he would turn his hand away, and on getting it near his mouth, would seize it with both hands, and throw it suddenly down his throat, immediately throwing himself back, and gasping for breath; owing to these causes, but little stimulus was taken. At 3 o'clock he was attacked with spasms, which continued for 2½ hours; a teaspoonful of black drop (acet. opii) was then given; a drachm of chloroform was poured upon a sponge, and held to his mouth and nose; this at first startled him a good deal, and it was not without difficulty that he could be got to inhale it. It had, however, a soothing effect upon him, and the spasms left him.

While the spasms were upon him, his muscular system was in most violent, irregular, and constant action; at times his body would rest upon the head and heels, and immediately after be thrown violently forward. It was found very difficult to keep him on the

bed; a number of assistants were required; no offer to injure himself, or any of the by-standers, was attempted at any time; immense quantities of thick, viscid mucus were secreted from his throat, from which he seemed in imminent danger of suffocation; in his efforts to relieve himself of this, it was thrown in every direction around the room. It was necessary for each assistant to have a towel to ward off this offensive matter. He seemed conscious of the impropriety of this, but could not help doing as he did. After the spasms ceased he remained for 6 or 8 hours perfectly rational, talking pretty calmly; desired to see a young lady to whom he was engaged, but on her approaching the door he motioned her to stop, and turning his back towards her, conversed quite rationally with her for some time. A person coming suddenly into the room, even opening the door, or the slightest noise, agitated him very much. He was extremely anxious to leave the room he was in, and go up stairs to his usual sleeping room, but in every attempt, on approaching the door, he would start back, with that peculiar catching of the breath, as though the fresh air deprived him of the power of breathing; while free from the spasms he slept quite composedly for short periods.

The spasms returned, after the interval named above, and were in all respects similar to the first. Chloroform was the only thing that had any influence in quieting him; they continued for a longer time, but again left him with some delirium; he again became rational, and slept for a short time. He died at 10 o'clock next morning (Wednesday). I was not present at the time, but arrived shortly after. No distortion of the features appeared as evidence of the terrible ordeal through which he had just passed. It was astonishing to see "how calm was his slumber."

CASE 29. *Reported by Dr. C. F. Clark, Woodbury, N. J.*

Mr. Driver, the brother-in-law of Mr. Murphy, was twice bitten on the hand, on the same day, and not an hour previous to Mr. M., by the same dog. He has had no attack of disease of any kind since. After Mr. M.'s attack was found to be hydrophobia, Mr. D. obtained from Philadelphia some nostrum said to be efficacious as a cure, as well as a preventive of this disease. I do not recollect the name of the discoverer; and put no reliance whatever in its power. Mr. D. describes it as excessively nauseous, smelling very much like the contents of a privy, and tasting accordingly. I had not faith enough in it to try it either way.

You will observe that it was about the first of March when these men were bitten, a time of year when we have pretty cool weather; it was just ten weeks from the inoculation to the invasion of the disease, and about this, I suppose, there can be no kind of doubt; although this is the only case of hydrophobia, in the human being, that I have ever seen, I do not suppose there can be a doubt about the correctness of diagnosis.

The first symptom was an inflammation of the cicatrix. Had Mr. Murphy applied then, I should certainly have practised excision, and then it might have been effectual.[1] It would be well, perhaps, to have this fact remembered, when a person has been bitten, when no suspicions exist; the wound heals, and afterwards becomes painful, red, and swollen; there ought to be no delay in having the part removed, if in a situation admitting of it.

I have seen a number of cases of hydrophobia, in animals; 1 cow, 1 horse, and a number of dogs; the actions of dogs have not always been conclusive. I believe they always go away from home, and after a time exhibit the great secretion of mucus about the mouth. I do not know anything as to the length of time between the inoculation and invasion of the disease in dogs.

In the case of the horse which I saw, it was just one week from the time he was bitten to the attack of the disease. I saw him the next day after the attack; there was then a slight foam about his mouth; he was bitten upon the upper lip, which was slightly swollen at the spot; he was constantly champing; no remedy was tried, except bleeding, but the blood was thick and dark, did not flow freely, and soon stopped. I started the next day, with a good supply of chloroform, to try it upon this horse; he was 10 miles from my residence, but on my way I learned that the owner had shot him, after spasms had come on, the previous evening. I do not remember the time of year when I saw this case in the horse; the weather was cool, I think in the spring.

Case 30. *Reported by Dr. C. F. Clark, Woodbury, N. J.*

A pig belonging to a Mr. James Dilks, of this place, was taken sick, and as it had been bitten two weeks ago last Sunday, by a strange dog, it was supposed to have the hydrophobia. This morning on hearing of the case went to see it; it was lying down, and ap-

[1] *Note by the Committee.*—"Experience leads us to believe that the excision of the bitten part, at any time before the general symptoms of the disease have appeared, will avert the disease."—Godman, *Nat. History*, vol. i. p. 169.

peared not to be suffering much; its mouth was surrounded with a white foam; on touching it with a stick it threw up its head violently from side to side, got up and staggered about the pen; on presenting a tin basin of water to it, it caught the basin in its mouth and bit upon it hard enough to indent it considerably, threw it violently aside, at the same time squealing as if in pain, exhibiting in its movements evidence, by its irregular gait, of spasmodic action of its muscular system. I have not a doubt of its being affected with hydrophobia.

At the time this pig was bitten, there was in the pen with it another, the nose of which was entirely torn off by the same dog. It occurred early in the morning the dog was seen to leave the pen; no suspicion existed at the time of the dog being rabid, nor has the dog been recognized since to any certainty. How much more damage has been done is of course not known.

On finding his pig so badly bitten, and it being fat, Mr. D. offered it to a neighbor if he would kill it, which he did, and it was consumed in his family. No little alarm was excited amongst them yesterday, on finding this other pig sick and exhibiting symptoms of hydrophobia. I do not think there is much cause for alarm; the pig was bitten on Sunday morning, was killed on Monday, before the virus had time to penetrate the system, and it was not certain that the disease could be propagated by consuming the flesh even of a rabid animal, after it had been cooked, though I suspect very few would like to try the experiment. There are a good many rumors around the town to-day of dogs exhibiting signs of disease. I shall have an opportunity, before mailing this letter, to learn something of their truth, and communicate the result to you. I met Driver a few days since in Philadelphia in perfect health, I mean the man bitten at the time Murphy was, whose case I before communicated to you.

I thought the case of this pig would be interesting, from the fact of its occurring in cold weather, and from another fact, which I think is unusual; according to what I have seen, *rabid dogs do not often worry the animals they bite, they only give them a snap and go on;*[1] but in this case, one of these pigs had his nose eaten off entirely, the other was bitten on the lip and ear, and a piece of the tip of the ear bitten off; this helped to lull suspicion; occurring, as it did, about the time Mr. D. had killed his hogs, it was supposed the dog had

[1] Italics by Committee.

been prowling around after something to eat, and had *quarrelled with the pigs* in that way. I begin to think the only effectual dog law, is one to exterminate them. Our corporation prohibits dogs running at large without muzzles in summer, but they are at perfect liberty now to bite whom they please.

31*st*. P. S. Pig died last night; one dog has been killed that exhibited signs of hydrophobia.

CASE 31. *Reported by Dr. A. Hunton, Hydepark, Lamoille Co., Vt.*

The 24th May, 1840, I was called to a son of Thaddeus Newland, of Hydepark, Lamoille County, Vt. The name of the lad who had symptoms of hydrophobia was Arry Newland, aged fifteen. I was conducted to his room; he was in bed; I took hold of the sheet, and spread it up toward his face with a quick motion, to agitate the air; he catched his breath and sighed deeply.

This test, with the shudder at the sight of water, was satisfactory evidence of the character of the disease. Five weeks previous, the lad was bitten by a small dog, as he concluded accidentally; as the dog was digging for a squirrel, the boy took hold of a root to help the dog, and was bitten. The dog ran to the neighbors, was cross, and showed so much fight, that it was killed. There was a suggestion that the dog was rabid, but the idea faded and was nearly forgotten. The Thursday and Friday before I saw him, he was noticed to be listless, dull and taciturn; was asked if he was unwell; said not, but Friday evening he called for water; was presented some by his mother; he shuddered, appeared perturbed, and refused to swallow. This was the first notice of the nature of the complaint. The father was called; other trials were made until they were satisfied the lad was rabid. He being very thirsty, some cider was put in a phial; an oat straw was inserted in it; he would sip enough from the straw to wet his mouth. I informed the father the disease was hydrophobia, and the child could not be cured; compared the case with inoculated smallpox; that the boy was inoculated with a specific virus; it is now operating in the system; reason would teach any reflecting mind the disease could not be averted, and was incurable.

To satisfy friends, I advised to give him a lobelia emetic, thinking it might obviate some regrets or misgivings in the family after the decease of the child. The tincture of lobelia being put in the phial with the cider, he sipped enough through the quill to cause emesis, after which his breathing was not as laborious; he was more calm for

some two hours. To make my narrative intelligible, I must digress. Two years previous to this, a Mr. Richardson, of Elmore, was bit on his hand by his fox-hound, supposed to be rabid (which probably was not the case); the news went to Montpelier, twenty miles. A Mr. Wright, a Thompsonian practitioner, hearing the circumstance, rode to Elmore and tendered his services to Mr. Richardson; he being a man of *common* sense, did not employ him, neither did he try any preventive; he is still living. Had he taken the lobelia and steam of Mr. Wright, he (Wright) would have had a tall plume added to his turban. This was known to the father of the lad, Mr. Newland; his older sons had without his knowledge sent to Montpelier for Dr. Wright; he was not at home, he being a *clergyman* was off curing souls, it being Sabbath, whether with steam or pepper I am not informed.

A young ignoramus employed in Wright's sweat-house, made his appearance soon after I left. I much regret I did not see him. I wished to give him a short lecture he would not soon forget. It is said he introduced himself as *Doctor* Sartle. Mr. Newland asked him if he could cure the hydrophobia; he unhesitatingly answered "*yes.*" Newland was somewhat posted on the disease; I had left with him Thatcher on hydrophobia. He asked Sartle what he would use. An *airb.* What herb? He declined to inform, fearing some of the regulars would know as much as himself. Newland informed the sage *doctor*, he should not give his child any medicine until he knew what it was; he then acknowledged it was lobelia. He was then asked if he had ever performed a cure; he answered he had. Who? was asked. He was loth to give the name, but being urged he gave Mr. Richardson. Newland informed him he knew that to be false. Mr. Newland informed the miserable (may I write it) *devil*, he had imposed on him, that he was convinced his child must die; he gave *Dr.* Sartle a parting blessing; he departed I presume not feeling much elated.

I tarried with the lad until Sunday noon; his appearance was quite similar to those afflicted with delirium tremens; he appeared to see some frightful object; he desired on Sunday morning to be left alone; he raised a window, crept out, leaped two fences, and ran some distance into the field.

There was living in the family a young man, on whom I had performed castration; this probably was known to the patient. I went into the room a short time before I left; he sprang on the bed, leaned against the wall, looked frightened, and said to me, "You

old *cuss*, you want to cut out my b——x, don't you?" When I left, I concluded he would live until noon on Monday; I wished to see him again; informed the friends I would see him the next morning; started on Monday, but heard of his death. He would have turns of raving; would strike, but I did not see him attempt to bite. It required some strength to confine him. The probability is I have been more minute than necessary. If there is any useful information, regard it, and reject the rest. I should like to be informed of your reception of this. I am old, my mind is treacherous; please excuse my imperfections.

CASE 32. *Reported by Dr. J. H. Beech, Coldwater, Mich.*

My knowledge of hydrophobia is next to entire ignorance; but a few facts have passed under my observation which may *assist* stronger evidence, although their own weight is diminished by not having been recorded at the time with dates and particulars. I think it was in February, 1842, a small dog came into the enclosure of Dr. Martin Mason, at Gaines, Orleans Co., N. Y., and flew at his cow, and I believe drew blood from one ear. It was only thought to be young and mischievous, and was not killed till it had travelled twelve or more miles east, if at all. I have an impression that some weeks afterwards a rumor came to that effect. One other animal was bitten in the immediate vicinity, and showing signs of disease of some sort about two weeks after the death of the cow (which I will describe), was killed.

The said cow showed no signs of disease until *six days* afterwards. (I may be mistaken in the time.) Her quantity of milk was less on the evening of the sixth. The next morning she was heard before day, about two miles west of home, making a frantic moan or bellow, and was found to have been running in a circle of about three rods in diameter, and was foaming at the mouth; the eyeballs fiery and prominent. I saw her about nine (9) o'clock; she was then unable to stand, but would show a disposition to hook and push on the nose with open mouth, which was interpreted as snapping, by the by-standers. I recollect well that a part of her circuit was through a deep snow-bank. She died about 11 A. M. There seemed to be no doubt in the minds of those who saw her that the disease was produced by the bite of a rabid dog, although poison, "phrenitis," and other causes were mentioned.

I have known of the killing of several *rabid* dogs in the vicinities in which I have been, none of which have been in the "dog

days" or hottest season. Yet all the others have been in warm weather.

CASE 33. *Reported by Dr. J. H. Beech, Coldwater, Mich.*

A cousin of my mother was bitten, when a child, by a rabid dog. A quack remedy containing acetate of copper was administered, and as it did not kill, it was thought to have cured her. Ten years after she was so unfortunate as to break her arm, and died in a few days with marked symptoms of "*rabies.*"

I have no means of getting at the particulars of the case.

CASE 34. *Reported by Dr. G. D. Ayres, Brooklyn, N. Y.*

Michael Casey, aged about 40, was employed as harness washer in a livery stable in this city. In April last, whilst endeavoring to catch a bitch pup about four months old, was bitten (not severely) on the fleshy part of the hand, between the thumb and forefinger. He treated the wound as a trifling affair, and adopted no prophylactic measures. About three weeks after he was bitten, he was employed to bury two dogs which had been killed in the same vicinity, one of which was unmistakably rabid, and severely bit the other, covering him with saliva and blood. This dog Casey freely handled. The wound from the bite cicatrized, but as near as I can find out his hands at this time were abraded in several places. About ten weeks from the day he was bitten he exhibited the first symptoms of the disease, when about taking some soup. At the first spoonful, he complained of a sore throat, and spat it out, saying he could not swallow it. This was at noon on Thursday, the 9th August. On the 10th he kept quiet at home, refusing all food or fluids, although complaining of great thirst. On the 11th (in the evening), I first saw him. His countenance expressed anxiety; he was sitting up in bed. Pulse 80, but varied in frequency at short intervals. He complained of no pain in the head or arm; tongue moist and slightly furred. The room was darkened and the windows closed, he having intolerance of light, and apparently great susceptibility to any currents of air; objected to being fanned, &c., yet did not complain of being cold or chilly. He begged for water, and after several ineffectual attempts to drink or even get the glass to his lips, I told him to open his mouth and close his eyes, and suddenly I threw a dessertspoonful of water in his mouth. This act was followed by a most violent choking spasm of the muscles about the throat; he swallowed but little of it, the

most being spilled over his chin. After a little, he said "he could take more, after he got a little used to the water," and asked for some to wash his hands in; this act produced hurried inspirations. I asked him to put a piece of ice in his mouth, but as his hand approached his mouth, his head apparently involuntarily receded from his hand, but when once in his mouth, he allowed it to dissolve and swallowed it, not without difficulty, but with less spasm. Having no convenience for his proper treatment at his house, and he being constantly annoyed by the visits of the curious, his removal to the King's Co. Hospital was advised, whither he was taken on Sunday morning, the 12th inst. On starting he appeared quite cheerful; said he felt better, shook hands with his companions, &c. Deglutition was about as difficult and painful as the day before. After admission to the hospital he drank some brandy and water, and also a little gruel with difficulty, and was cupped on the cervical region of his spine. In the P. M. a dose of laxative medicine was exhibited, after which he slept some, but was restless, and talked wildly. About midnight he awoke. Complained of pain in the hand (in which he was bitten) and in his arm, which finally became paralyzed; also of his throat, and was now constantly spitting out shreds of viscid mucus. From this time he had occasional spasms (of his whole body), and died exhausted on Monday the 13th August, at 12½ o'clock P. M.

Post-mortem appearances.—Aug. 16th. Externally, livid patches, particularly on posterior surface. Vessels of membranes of brain congested, but nothing remarkable about the brain itself. The *papillæ*, especially of the back portion of the tongue, were enlarged and the parts about the epiglottis, larynx, and trachea, as well as the pharynx and œsophagus, were very red. Mucous membrane of the stomach softened, and at the greater curvature was abraded for some three or four inches in circumference, and diaphanous; lungs, with exception of some old adhesions, normal; liver large and flabby, and all the viscera much congested. The spinal cord, down to about the 10th dorsal vertebra, was covered with an effused lymph. Ossific deposits were found in the aorta, and large quantities of sero-purulent matter escaped from the spinal canal when exposed.

This man had been notoriously intemperate for some years past, cannot find out that he ever had delirium tremens. For some three weeks previous to his death, he had stopped entirely the use of stimulants.

The same pup a few days before had bitten a boy, who was teas-

ing him at the time. His wound was freely cauterized with arg. nit. immediately. Up to this time he enjoys his usual good health.

The dog was killed immediately after biting the man, without exhibiting any of the usual symptoms of rabies. Several other dogs have been killed in this vicinity this summer, all showing more or less the symptoms of hydrophobia.

As to the dog laws, we have about the same laws here as in New York city, but they are very imperfectly enforced, if at all.

Your letter should have received an earlier answer, but I was delayed in obtaining some of the data. If there should be any points in this case on which you would desire more explicit information, it will afford me much pleasure to collect them for you.

CASE 35. *Reported by Dr. Roelker, Cincinnati, Ohio.*

Henry Uthoff, 28½ years old, laborer, married, a native of Prussian Westphalia, came to the United States in 1845; was a resident of Cincinnati since 1849; a middle sized man, rather slender, of dark blond hair, brown eyes, of irregular habits, not a drunkard, but would drink too much when in jovial company, which would happen sometimes once, sometimes twice a week; a trifler in talk and action, who would tell stories for the fun of it, hence not reliable in his words; was bitten May 17th, 1855, at about 4 A. M., while going to his work, by a strange dog, who wore a part of a chain around his neck. Whether the dog was mad remained unknown. Uthoff is said to have seized the dog by his neck and thrown him upon his back, upon which the dog bit furiously into his hand, and kept such a firm hold of it that Uthoff could not free himself of it until he seized the dog by the throat, and nearly strangled him. The dog never was seen again afterwards. Uthoff washed his hand in water and bandaged it, but never consulted a physician, although he was urged to do so. The wound continued sore for about four weeks, when it healed up. Early in June he went to Illinois, from whence he returned on Friday, the 29th of June, at midnight. He ate and drank, and went to bed. Saturday, the 30th, he complained of heaviness and weariness in his limbs, and feeling sick all over, which he ascribed to having taken cold on board of the boat. He ate and drank but little. The following night he did not sleep, and talked loud, as if dreaming. On Sunday, July 1st, he complained of pain in the bitten arm, and of a prickling sensation running from his fingers up to the shoulder, for which he was advised, by his friends, to bathe the limb in warm water. When trying to do so he shud-

dered, and turned off with aversion, without accomplishing it. During the day he felt unwell, and weary, and heavy; had no appetite, still ate and drank something, and spent part of the day in company with his friends. The following night he was more restless, talked loud, as if dreaming, made queer noises, but could not turn over in his bed. Monday morning, July 2, he could not wash himself, shrunk back from water, and could not drink his coffee. Then he went about two miles to get medical advice; did not, however, represent his true case, but stated that he felt unwell, weary, and oppressed about his chest; thought he had taken cold on board of the boat, where he slept on deck, on his return from Illinois, and led, by his statement, to the supposition that he had contracted an intermittent. In the afternoon, his landlord came and communicated his suspicion, and a part of the above history of the case. I saw him the same evening, with a medical friend. He was perfectly rational, answered all our questions, told me himself that he had been bitten by a dog, and swallowed some water, by my request, although it cost him a great effort, and it was accomplished with great difficulty. Ice was put upon the nape of his neck, and chloroform and the tr. rad. aconit. applied to his throat, and, his tongue being very much coated, an efficient dose of calomel was administered, to act upon his bowels. The medicine acted well, but the applications could not be kept up, as he was excessively restless all night, and wanted constantly to run off, or jump out of a two-story window. Early in the morning, July 3, he washed himself, was perfectly quiet, rational, and docile, but his eye was wild, the profuse perspiration continued on him, as well as the rapid pulse and the spasmodic contractions of his throat. Towards noon, eight grains of the powdered root of belladonna were administered, as fresh as it could be obtained in the city, although it was not of this spring's growth, and ice ordered to be applied the whole length of the spine, which proved, however, impossible, on account of his restlessness. In the afternoon he drank water, but continued so restless the whole day and night as to keep about a dozen men busy in watching him, to prevent his running off, or jumping out of the window. In the morning of the 4th of July, about 4 A. M., he drank coffee, with some, but not a great deal of difficulty. At 7 A. M., he was too much exhausted to leave his bed any more, although he sat up in it; he hardly knew me; he answered some of my questions, but it was with great difficulty that he could collect himself sufficiently; the profuse cold perspiration was running

down his body; his hands were ice-cold, and their skin purple-bluish and corrugated, like a cholera patient's, in the state of collapse. He died at 9 A. M., the same morning, and was buried in the evening of the same day.

Post-mortem examination was not made.

CASE 36. *Reported by Dr. J. E. Pearson, Vienna, Ala.*

If there are extant any *municipal regulations* or "Dog Laws," in this State, I am not aware of it. This may be attributed to the very singular fact, that there are no rabid dogs in Alabama! I have practised my profession twenty years in this State, and have heard of no case of hydrophobia, and have taken pains to get information from others older than myself who have preceded me. In South Carolina, however, where we were frequently terror stricken by the unwelcome visitation of such guests, now and again a case did turn up to the alarm of the neighborhood and the discomfiture of the physicians, during my minority, in the little village of Monticello, Fairfield Dist., S. C.

A most excellent old lady, Mrs. Jane Porter, aged about 65 years, of bilio-nervous temperament, dark complexion, was bitten by a cat whilst she was visiting her garden in the summer, for the purpose of gathering vegetables for dinner. The cat was, it seemed, a constant companion in her daily walks, and owing to its peculiar friendship and sagacity before, this circumstance alarmed the husband, who immediately called in my brother, Dr. Geo. B. Pearson, who was then practising his profession in the village. He suspected the animal of hydrophobia after reviewing the circumstances, and proposed to put her under an alterative treatment, which he did by the administration of small doses of mercury, for three months. Under this treatment her health did not only continue good, but seemed to improve. At the end of which time he either concluded that nothing was the matter of a serious character, or if it had existed perhaps the mercurial had overcome it. In this, however, he was sadly mistaken; as soon as the alterative ceased to exert its influence upon the system she gave signs of hydrophobia. One morning while engaged in dishing out tea, she had constriction about the larynx and glottis. She arose from the table and sent for the doctor; being myself at his house, I walked over with him, who, on hearing the relation from herself of her feelings on pouring out the tea, requested me to hand her a glass of water, which I did. She raised it to her mouth, but immediately dashed it down upon

the floor, and arose from her chair seemingly to get her breath. These symptoms from day to day grew more aggravated, and on the ninth from the attack, she left for the spirit land, with full confidence of rest in heaven, and had for the twenty-four hours previous no distress either of mind or body, which period she spent in kind admonitions to her friends and neighbors to prepare for eternity. I recollect that during her illness she could not bear to look at a mirror, the light of day, or of any fluid or polished surface. Owing to spasmodic stricture of the throat occurring in paroxysms, she made a strange noise in attempting to breathe, which caused the ignorant to circulate a report that she barked like a dog and at other times mewed like a cat. I have been thus particular in detailing the above case, and perhaps unnecessarily tedious and uninteresting; but as far as it goes, it proves the unmistakable origin of the disease, and the fact, too, that if not curable, it can be postponed. It also indicates that the isothermic condition of the year has something to do with the causation of hydrophobia. The opinion has obtained that rabid animals are only to be met with in the summer solstice; this is with me the result of observation and experience. One of my neighbors once had a great many of his hogs and cattle bitten in the summer; I saw the pigs sucking, and when the old sow or sows would take a suffocative paroxysm, which was preceded by a terrible squealing, the little pigs would fly with consternation until the fit was over. The cows lowed most piteously. All died or were shot.

CASE 39. *Reported by Dr. J. H. Griscom, New York.*

Edward Bransfield, aged 28, was brought to the N. Y. Hospital about 2 P. M. on Monday, 14th May, 1855, attended by two or three physicians and a crowd of curious people. On admission his face was flushed, the eyes wide open and pupils remarkably dilated—the whole expression indicative of terror and distress. He was suspicious and fearful, shrinking when the hand was laid upon him, but not dangerously disposed.

He was received by the house physician, who placed him immediately in bed in a quiet room, under the care of a good male nurse, removed from his presence every person and thing that might annoy him, and administered immediately such soothing remedies as were admissible. He soon became tranquil, answering questions intelligently, and submitted without remonstrance to what was deemed necessary. He complained of a sensation of air

blowing over him, the windows and doors being at the time closed. Accumulations of tenacious saliva troubled him somewhat, but when asked if he would take some water he quietly declined, saying he thought it hurt him. None was then presented to him. His pulse on admission was 160 per minute and full, but at 3 o'clock (one hour afterwards) it had declined to 136. The respirations were 16 per minute.

Soon after this an opium pill was ordered for him, and the nurse inadvertently brought in a tin cup full of water to assist him in swallowing it. He started up in bed with an expression of horror and apprehension, swearing fiercely, and intensely enraged. The cup was instantly removed, and he was soothed and persuaded to take the pill into his mouth. He attempted to swallow it, but failed. He lay quiet for a moment, then started up in a violent rage to spring at the throat of the nurse, spitting vehemently, with furious voice and gestures. He was easily prevented from inflicting injury, but the assaults being repeated, was restrained by force. When he became quiet again, he said that in the paroxysm he was "not himself."

On being gently fanned with the hand on his bare head (which was naturally devoid of hair), from such a position that the hand could not be seen, he burst into a violent expression of rage, swearing and exclaiming, "It was better to knock him in the head at once than do that way." These experiments were not repeated, and he was kept as calm as possible.

It being at this season my tour of service at the hospital as attending physician, I was immediately notified of the case, but in consequence of other engagements did not receive the notice in time to reach him before 8 P. M. The foregoing statement is condensed from the report furnished me by the house physician, Dr. Mills. I found the patient at the time of my visit on the bed, to which he was strapped to prevent injury to himself and others, perfectly calm to all appearance, intelligent, and entirely submissive to treatment. He conversed freely though with some confusion of dates and facts respecting the time when he received the bite (between four and five weeks previous), and other circumstances connected therewith, and of his own feelings then. The scar was upon the lower lip, perfectly healed and exhibiting no signs of irritation. As he thus lay and conversed, no one could suppose that he was laboring under so fatal an influence, unless either the finger were laid upon the pulse, which now numbered nearly 160 and was full

and bounding, or he complained of the pain in his throat and difficulty of swallowing. On examining his throat a degree of redness was observed in the fauces, accounting partially for the pain of deglutition. After giving further directions for his continued comfort and the prevention of more convulsions, it occurred to me to test the truth of some of the popular notions respecting this disease, especially in relation to that peculiar symptom from which it derives its name, viz: *The dread of water.* The results of these investigations it is hoped may have the effect not only of correcting some false views on the subject, but what is more desirable, of hereafter alleviating the intense sufferings of those afflicted with the disease, if indeed they may not increase the means and probability of recovery.

The most distressing part of the malady is undoubtedly the *difficulty and pain in swallowing*, arising from sharp spasmodic action of the muscles concerned in this function, extending sometimes even to those of the neck and chest, and producing a feeling of alarming constriction of the organs of respiration, causing almost complete though temporary suffocation, and thus aggravating if not actually exciting the convulsions, with the more or less violent contortions and discoloration of the countenance, protrusion of the eyeballs, and other active painful symptoms. It is a popular idea that all these are excited by the sight and even by the sound of water, and although an intense thirst almost universally co-exists, the friends and even the patient himself, anxious as they are to alleviate it, dread even the presence or sound of water, much more its approach to the lips, lest all these horrible symptoms should ensue. My investigations, simple as they are, throw light on these points, and it is hoped will show how relief may be extended in future in those most distressing symptoms—*thirst* and parched and burning throat—if the means thus pointed out are sufficiently, promptly, and carefully attended to.

That the mere *sound* of water will not excite the paroxysm was proved in this case by the fact, that the noise of a stream of water in a closet was continually within reach of his ears, to which he gave no heed whatever while I was by him, though it is said that when he first heard it he was unpleasantly affected by it. Observing this, I then desired to try whether its actual taste, *without swallowing*, could not be safely borne; and to this end I induced the patient to take a mouthful, but to hold it in his mouth without attempting to swallow. *He did so*, and after retaining it sufficiently long to satisfy

both him and myself, at my direction he ejected it from his mouth, expressing gratification at its cooling effect.

One step further I determined to go, though not without some fear of producing a paroxysm of pain and perhaps a convulsion. I sent for some ice, and with a little persuasion placed a small piece in his mouth, directing him to allow it simply to trickle down his throat as it melted, avoiding as before every effort at swallowing. A piece of about the size of a thimble was first tried, the cooling effects of which were exceedingly grateful, and he willingly accepted a second piece. It was very difficult for him to avoid deglutition; he did succeed, however, and all the ice descended to the stomach as it melted drop by drop, demonstrating in the most conclusive manner that water *per se* has no influence in the causation of the spasms, and that the disease is improperly named. It is not a *hydrophobia*, a dread of water; it is rather a dread of *swallowing*, whether of water or any other liquid, or even of solid substances, as my patient said to me; and if that act can be avoided as in his case, relief may possibly be afforded in others by the administration of cooling and perhaps even more decidedly palliative remedies. In fact, encouraged by these observations, I directed the application of a strong solution of nitrate of silver to the fauces with the view of allaying the irritation apparent there, and this he bore with not more difficulty than is noticed in a majority of the cases in which this astringent is applied for other diseases.

By these means, and the administration of anodyne and nourishing enemata, the application of cool cloths to his overheated head, mustard poultices to his extremities, and dry heat to his general surface, and even by inducing him, a few hours before death, actually though slowly and with some difficulty, but not so as to bring on any general paroxysm, to swallow some ammonia and brandy, the patient was not a little comforted, and his passage to the grave made more quiet and less painful. Unhappily, there is yet no known antidote to this mysterious poison, and the symptoms can only be treated on general principles. The ebb of life was attended with no unusual phenomena, none of the unnatural sounds, barking, or frothing, or biting popularly ascribed to this disease, being noticed. The vital powers became gradually exhausted, until at 9¼ o'clock on the 15th, twenty hours after admission, he breathed his last.

What the treatment was during the three days of his sickness prior to admission into the hospital I have not been informed, ex-

cept in being told by him that he had not been able to swallow anything. What effect an early adoption of the suggestions above made might have produced it is of course impossible now to say; yet the thought is unavoidable that this mode of administering cooling liquids, carefully followed in the early stages of the malady, might sometimes have a very soothing and calming influence, and even pave the way for the introduction of more active remedies.

CASES 43, 44, and 45. *Reported by Dr. James S. Hawley, Buffalo, N. Y.*

I inclose to you the statistics of three cases of hydrophobia which have fallen under my observation.

James Caho; the time of his inoculation not known; attacked January 18, 1854; died January 22; was healthy and robust, but addicted to drink; about 30 years old.

Mrs. Willard; bitten by a cat, January 21, 1854; attacked March 24; died March 28; between 50 and 60 years of age; feeble and supposed to be convalescing from protracted uterine disease.

Laurence Mier, bitten, in the latter part of July, 1854, by his own dog, which he had cruelly beaten, a few days before. Attacked Sept. 14, died Sept. 18. The particulars of the cases of Caho and Mier may be found in the *Buffalo Med. Journal*, for May, 1855.

I was myself bitten by the cat which bit Mrs. Willard. The wounds were carefully excised the same day, and no bad results have followed.

CASE 46. *Reported by Dr. Z. Pitcher, Detroit, Mich.*

From the commencement of my residence at this place, as a citizen of Detroit, in 1836, I have seen but one case of hydrophobia in the human subject, which occurred seven years ago, in the latter part of May or the first days of June, under the following circumstances: Two little lads, each about eight years old, were playing together on a small unfenced lot, across which the dog made his way, in passing from one street to another, which constituted two of the boundaries of the vacant common. On attempting to caress the animal, both of them were bitten, but whether the one that became rabid, or the one that escaped was bitten first, I could not ascertain. The cries of the children soon brought friends to their rescue, but the dog nevertheless made his escape.

One of the boys was seen by a physician who applied chloride of lime to his wounds. He escaped hydrophobia. The other was

taken care of in the family. His wounds healed readily, but symptoms of water-dread showed themselves on the nineteenth day, and he died three days afterwards without medical treatment. This omission of all effort to arrest the disease was occasioned by the timidity and nervousness of the child, which was partly natural and partly induced by the disease, and from one or the other cause, so highly developed that the approach of a physician would induce a paroxysm of suffering almost as surely as the sight of water. This account is as accurate as it is possible to make it, for the family (some of whom I have seen to day) kept no record of the case, neither did any of the physicians who visited it, like myself, from professional motives, keep any memorandum of the occurrence.

I have no knowledge of any other case, if such have occurred in Michigan, and I have made inquiries of my professional acquaintance for that purpose.

As pertinent to your inquiry, though not containing all the information you desire, I will state that in my early youth, when I resided in Washington County, N. York, I saw repeated instances of canine madness, some of which dogs thus mad, bit stock upon my father's farm; all of which occurred late in autumn, when people were gathering apples and potatoes. I will also add, that in the month of April, 1831, at Fort Gibson, Cherokee Nation West, after a severe winter, which killed the cattle of the Cherokees, the prairie wolves who fed upon their carcasses became rabid and communicated the virus to some of their domestic animals, but not to any of their people.

Our "Dog Ordinances" take effect in July and August of each year.

CASE 49. *Reported by Dr. B. P. Miller, Mt. Carrol, Carrol Co., Ill.*

In the village and neighborhood in which I reside, rabid dogs have been very plenty since about the first of January, 1856. The cold has been intense through the months of January, February, and until about the 20th of March; the temperature nearly the whole time was from 18 to 30 degrees below zero. Dogs through those months have continued to be afflicted with rabies.

Cattle and horses which were bitten by those animals, were attacked with the disease in from sixteen to sixty days after they were bitten; death occurred in from one to three days after the disease was developed in horses or cattle. I have not known of a dog being confined, and cannot say how long the dogs would live after

being attacked with the disease; the dogs have been invariably killed as soon as possible.

I have had but two cases of the human subject bitten, in my practice; one, a fine, healthy boy, about 6 years old, of sanguine nervous temperament, son of Mr. Horace Melondy, of York Township, Carroll County, Ill.; the other a hired man, in the employ of Mr. Melondy, of bilious nervous temperament; they were both bitten by the same dog, on the 5th day of March; the boy was badly torn on the face: one tusk of the dog entered the orbit, near the inner canthus of the left eye, making a wound obliquely downwards, and cut about 1½ inches long; he was also bitten through the lower lip, and in several places on the cheek. The hired man was bitten on the finger in trying to secure the dog.

I was sent for immediately, and saw the subjects within four hours after they were bitten. I excised the bitten part as much as I could, and used nitrate of silver freely to the wounds, first washing and syringing the wounds freely. After probing the wounds with solid nitrate of silver, I pulverized the silver, and filled the wounds with the pulverized silver; as soon as the cauterized part sloughed, which occurred in two or three days, I again applied the caustic, continuing to wash the wounds freely. I gave internally calomel, until slight ptyalism was induced, dressing the wounds, after the eighth day, with simple dressings; the child's health continuing very good, wounds healed rapidly, no unhealthy appearance appeared at any time; complained of no pain or soreness in the wounds until Thursday, the 20th, fifteen days after he was bitten. In the afternoon he complained of darting pains from the wound near the eye, with twitching of the muscle of the eye; through the night, was restless, starting suddenly from sleep, complaining of pain in his eye. In the morning of Friday, felt better, and played as usual, and appeared to feel well, until about 4 o'clock, when he called for some water; his mother gave him a drink, he hurriedly swallowed a mouthful, and complained that it choked him, and could not be induced to try to swallow any more; complained of soreness in the throat, and darting pains through the eye; complained of thirst, but the sight of water produced convulsive action, particularly if the water was in motion. If water was carried to him without ruffling the surface, he could look at it without any convulsive action, but shake the water, and spasm was the consequence; we succeeded, however, in getting considerable fluid into the stomach, by placing a wet cloth over the mouth. The boy could compose the

mind, so that when the cloth was removed quickly, and a spoonful of water poured into the mouth, he could swallow. If an attempt was made to give any more, convulsive action would be produced; but replace the cloth, and allow some time to elapse, the mind would become composed, the boy would request the cloth removed, and another spoonful of water poured quickly into the mouth he could succeed in swallowing it. From Friday until Thursday evening, at which time he died, the eyes were staring widely open; in fact, there appeared to be an inability to close the eyelids; he did not even wink; there appeared to be a perfect rigidity of the muscles. The spasms continued to increase in violence until Sunday, about 4 o'clock, at which time he was taken with a violent convulsion, which lasted about one hour and twenty minutes; after which he gradually sunk, and ceased to breathe about 7 o'clock.

CASE 50. *Reported by Dr. B. P. Miller, Mt. Carroll, Carroll Co., Ill.*

The hired man was subjected to the same treatment, but the bitten part I was able to completely excise, and I applied the caustic freely; there has been no symptom of the disease as yet in the man; the wound has healed, and he has been at his ordinary avocation for some time. Several cows and quite a number of dogs bitten by the same animal have become rabid.

There have been no dog laws enacted in my vicinity until recently.

So far as my observation in relation to rabies goes, I have found in the region of country I live in, that the disease occurs more frequently in the winter and spring than at any other season of the year. The extreme cold of this winter appeared to have an influence in producing the disease, as the cases have been far more numerous this winter than in former years, and this winter has been far colder than any for a number of years; in fact, to my knowledge I have not known the disease occur in warm weather in this country.

If the Committee or Association in their deliberation or correspondence elicit any information in reference to the treatment either before or after the disease manifests itself, they will confer an obligation by forwarding me the results of their investigations.

CASE 63. *Reported by Dr. Jas. M. Newman, Buffalo.*

This case occurred in the practice of Drs. Nichell and Weiss, German practitioners of this city, and no detailed record of the case was made at the time, my knowledge of the facts then being derived

from the certificate of the cause of death filed in the city clerk's office, and from the statement of one of the Health Inspectors; the latter I fortunately made a memorandum of at the time. For dates it will perhaps be the most certain to rely upon what written records we possess.

The certificate of the cause of death, returns the following: The patient's name, Nicholas Lang, of German parentage; aged 11 years, 5 months and 3 days; died 11th of March, 1854; disease, hydrophobia; was bitten by a large dog nine weeks and three days before death. The symptoms continued for eighteen hours. Drs. Nichell and Weiss were called eight hours previous to death.

The father makes the following statement. His son was bitten about six o'clock in the morning. The dog belonged to a neighbor or acquaintance, and was in the habit of coming to the house, being apparently attracted there by a slut, and in the visits was troublesome to some fowls the family had in the yard. Upon this morning the father saw the dog coming to the house and called to his son, "that he would eat up the hens." The boy sprang out of bed, and went to the door to frighten the dog away, and while in the act of so doing the dog sprang at him and bit him through the fleshy part of the left forearm.

The wound was dressed with some application obtained from a midwife; it healed up, and nothing was feared at the time. The father makes the length of the time of the continuance of the hydrophobic symptoms several hours longer than stated in the certificate. He says his attention was first attracted, upon the boy's complaining of some indisposition, to the condition of the wounds, which he describes as so looking, that he said to his wife that he was afraid the son's arm was going to break open again. The indisposition increasing, and the manner and appearance of the boy being such as to excite his suspicions, after some little time he offered him a glass of water to drink, which instantly induced a paroxysm. Medical aid was then called. The same result of an effort to drink was witnessed by his medical attendants, and they had not the least doubt of the fearful character of the disease they were contending with. The boy had a strong desire to bite those about him, and warned them to guard themselves, and once snapped at his mother's hand, but fortunately missed it. A few minutes before he died, he asked for some bread and coffee to be given him, which he took, and his father thinks swallowed some, when he almost immediately sprang wildly up in bed, and fell back a corpse.

CASE 64. *Reported by Dr. Jas. M. Newman, Buffalo.*

A dog was bitten by the same animal about three days after he bit the boy. On the evening of the funeral of the boy, this dog exhibited symptoms of rabies, and was shot by its owner before he had an opportunity of doing any harm.

The dog which had created all the mischief was preserved by his owner, and notwithstanding the earnest entreaties of the father after the death of his son, the owner steadily refused to destroy the dog, accompanying him about town except when he was kept concealed from Mr. Lang, until the latter, losing all patience, went at last to where the dog was, took him and hung him. He says he does not now recollect how long this was after his son's death, but thinks it was several weeks. From a memorandum I made directly after the occurrence, I find that the dog was killed on the 14th of April, 1854, thirty-four days after the death of the patient!

Does the dog usually live so long after an attack of rabies? Has not his death generally been considered certain, and that very shortly after the development of the disease?

CASE 86. *Reported by J. Perkins, M. D., Castleton, Vt.*

Miss Sarah Crehore, of Newton Corner, Mass., of sanguine nervous temperament and healthy constitution, and cheerful disposition, aged 28 years, was bitten by a large mastiff dog on the 22d of August, 1849. The wounds inflicted, two in number, were on the anterior part of the right ankle; the inferior one, one inch, and the superior one, two inches above the articulation, both having considerable depth, and penetrating between the extensor tendons of the foot. The dog had acquired the character of ferocity by repeated attacks upon strangers who entered upon the premises of his master (in this instance, Miss C., with a friend, was crossing the garden of his master), but, as he was under perfect control of the family, was not suspected of madness. Yet, as he had in this way become very annoying (Miss Crehore's wound being a severe one), food was given him, which he ate in his usual manner; this was regarded as proof of his freedom from the canine disease, and the dog was killed; and, no apprehensions existing on this ground, the wound of Miss C. was only treated with simple dressings, and slowly healed so as to become completely cicatrized in four or five weeks.

The following winter, Miss C. resided a few weeks in the family of her sister, in this place (Castleton, Vt.), apparently in perfect

health; but probably entertaining some apprehensions in regard to the previous misfortune, which was inferred from her aversion to speak of the subject.

On the 16th of January, 1850, the 127th day from the infliction of the wound, Miss C. read in a Boston paper the obituary notice of Mr. Bean (of Boston), who died of *rabies canina* six months after receiving the bite of a dog which was supposed (at the date of the bite) not to have been rabid. The patient was evidently alarmed by this perusal, appeared anxious, and shortly afterwards complained of severe pain in the lumbar region, and lancinating pains in the right ankle, knee, and hip. These were relieved by a liniment of soap, camphor, and opium. The following night was sleepless, but quiet; her watchfulness was known by her fellow-lodger only by a frequent suppressed sighing, without complaining. She seemed to sustain her gloomy apprehensions in silence.

On the morning of the 17th she rose dejected and nervous, and, although she had not spoken of the subject of her solicitude, her friends, tacitly comprehending it, applied to me for professional advice, and, with the above history of the case, suggested their impression that her illness might be due solely to excessive alarm, which might be aggravated by a professional visit. Yielding to the suggestion, I contented myself with prescribing a strong decoction of valerian to be taken liberally at short intervals, and advised to various endeavors to dispossess the patient of the horrible idea which she evidently entertained; also a careful observation of symptoms and an immediate report if changed. The day was passed without appetite; moderate complaint of pain in the back and limb, which were treated as before; the patient being as usual about the house and employing herself with needlework. This condition being reported to me at 7 P. M., no change was advised in treatment.

At 9 P. M., with some impatience, she asked for "some drink," saying she was "very thirsty;" but when a tumbler of water was offered her, she recoiled from it with a shudder, and motioned it from her, and, after two or three spasmodic respirations, exclaimed, "*Oh, that dreadful disease is on me!*" and proceeded to express fully the fearful apprehensions which agitated her mind; but shortly afterwards, with great composure, she expressed her entire submission to the dreadful necessity of the case. A message was sent me, but being out of town, I did not see the patient at this time. Without repeating the attempt to swallow or complaining of thirst, she

retired to rest with her sister at 10 P. M., and remained quiet, silent, but sleepless, until 3 A. M., the 18th, when she suddenly sprang from the bed in great agitation and apparent alarm. She could not explain the cause of her excitement, but the few words spoken indicated no mental aberration. She was soon persuaded to return to her bed, and I was immediately in attendance. Found the extremities and surface of the trunk cool; pulse 70, small and weak; bowels constipated; urine scanty and high colored; slight pain in the back; "uneasy drawing" sensation in the right leg, and also in the præcordia. Speech earnest and hurried; intellect apparently sane. No recrudescence of cicatrix on the ankle. Tongue covered with a thin, moist, ash-colored coat, darker in the centre. Prescribed musk 20 grs., camphor 5 grs., in simple syrup, which was swallowed with some effort, attended by a slight spasm of the pharynx and sighing respiration. The patient also, in like manner, swallowed several spoonfuls of tea. Give calomel in pill, iv grs. each fourth hour, until dejection takes place; also continue valerian.

This success in again swallowing liquids was evidently unexpected to the patient, and appeared so to corroborate to her mind the advice of her friends, that her malady was *not* rabies canina, but a simple hysteria or nervous affection, as greatly to diminish her anxiety. This impression was followed by a tranquil sleep, which continued two or three hours.

9 A. M. patient more cheerful; surface warm; moderate perspiration; pulse 74; pain in back, and uneasy sensations in limb and præcordia diminished; tongue unchanged; sits up, swallows liquids from a spoon with less difficulty. Same medication continued. 9 P. M. patient more quiet and cheerful; has swallowed with but slight inconvenience at three several times to-day, a cupful of gruel; takes liquids from a spoon with comparative ease; pain diminished; pulse same in frequency, stronger; tongue and skin as before; has had free dejections from the bowels; converses cheerfully. From this time forward Miss C. evidently believed that her disease was hysteria, or some anomalous nervous affection, and *not* rabies canina, and hence was relieved from the fearful forebodings with which it was ushered upon her. Discontinued calomel; give ¼ gr. sulph. morphia; continue valerian, musk, and camphor.

Patient retired to bed at ten; desired to be left alone and without a light; was found asleep in half an hour; slept until 12;

awoke somewhat agitated, but slept again quietly nearly an hour, then awoke suddenly greatly excited; seized and held with great strength the nurse's hands; spoke loud and rapid, but distinctly and rationally for a few minutes, recognizing all in the room. Her speech soon became constant and increased in volubility, until it seemed impelled by a rush of incoherent recollections, pronouncing disconnected words, and at length disjoined syllables, and at last a rapid succession of inarticulate sounds. In this condition I found her at 2 A. M. the 19th. The saliva was abundant and constantly foaming on her lips or scattered around by alternate retchings to vomit, and spasms of the respiratory organs, mingled with attempts to speak. Pulse weak, 130; profuse perspiration; extremities cold; great heat of the head; wishes to get up; requires great effort to keep her on the bed; jactitation incessant; motions apparently voluntary, but accomplished with the rapidity and force of spasm. In short, the patient is in an agony of excitement, which is now aggravated by the sight of liquids and currents of air. With much difficulty, an uncertain part of ½ gr. sulph. morphia was given. Attempted to administer sulph. ether by inhalation; patient at first excited, followed by slight anæsthesia. After a little delay, administered chloroform in like manner, imperfectly at first on account of resistance; attempts several times repeated through 15 to 20 minutes, were at length attended with complete success; spasm and jactitation ceased; patient became silent, drowsy, unconscious. The last state continued but a few minutes, when she awoke as if from sleep. 5½ A. M. recognized those around her; wondered much at the disarrangement of her bed, dress, the presence of her friends and physician, &c., about which she asked several questions, but appeared easily satisfied by the reply that she had a severe attack of a nervous disease; she was evidently unconscious of all that had passed for the last few hours; she conversed rationally but with unwonted cheerfulness and exhilaration, apparently free from any unhappy apprehension; pulse 110, moderately full, soft; surface moist and warm; muscular strength much diminished, but arose from her bed with the aid of the nurse and reclined on an easy chair; took toast and tea without inconvenience; patient thus reclining was expressing her pleasant anticipations of returning to her home, whither she invited her friend, who was arranging her hair, to visit her. In the midst of a sentence her voice faltered, stopped, her head reclined, lips and nails were livid, and without a struggle she quietly ceased to breathe, about one

minute after she ceased to speak, and at 7½ A. M. of 19th Jan. No *post-mortem* examination was permitted.

CASE 91. *Reported by Dr. W. B. Gould, Lockport, N. Y.*

I was called to this case on the 13th of Nov., 1855, the day on which the child was bitten.

The child was 3 years of age, a boy, was bitten by a rabid cat (as was supposed), having belonged to a family whose dog had been killed after giving evident signs of having been rabid.

I went prepared to cauterize the wounds, which were upon the forehead and inner canthus of the left eye; but upon further inquiry the parents thought the cat not mad, and did not wish to have anything done.

The child sickened on the thirty-third day after it was bitten, on Saturday, and died on the Wednesday following.

I obtained the following history from his mother:—

The child appeared perfectly well up to the thirty-third day; it was then taken with vomiting, followed by fever, which lasted twenty-four hours. During the fever there was much thirst, and the child drank freely; slept some the first night after the attack; on the second day walked around the house, but was easily frightened; appeared watchful; if touched would start and scream out. From this time he could not partake of liquids or solids. On attempting to drink would experience a convulsive shudder, and was similarly affected, but to a less extent, in any effort to partake of solids. Slept none after the first night, but was constantly shifting about from place to place, and much of the time talking incoherently.

The day on which it died these symptoms were aggravated to paroxysms of raving, in which it appeared frantic. This would last an hour or so, succeeded by more or less quiet. It had three of these paroxysms, the last of which was followed by constant efforts to shift about, talking and shrieking, until exhaustion and death ensued.

The child took "Moore's medicine," in three days after being bitten, and continued it as long as deglutition could be performed. Did not see any effect from it whatsoever. Dr. Moore is an irregular practitioner, and claims to have a specific for hydrophobia.

I did not see the child from the day on which it was bitten until it died; I was then called to see it, and was told it was dying; Dr. Leonard accompanied me. We found the child pulseless at the wrist, and in the greatest possible agitation; we administered chlo-

roform, which gave temporary relief. Death closed the painful scene in a short time.

CASE 92. *Reported by Dr. C. W. Higgins, Abingdon, Ill.*

The first case of which I shall speak, is that of a Mrs. White, living two and a half miles southwest of this place, age 25; temperament nervous sanguine; taken March 29, 1855.

The attack was sudden; previous to it, however, she appeared irritable and melancholy. When called to see her, she had well characterized symptoms of hydrophobia. The sound of liquids would cause violent spasms; a current of air would also produce the same effect; so sensitive was she, that any one on approaching her, and causing an almost imperceptible motion of the atmosphere, would cause the spasms. Saw her on the following day (March 30); symptoms had increased so much that she was unable to swallow either liquids or solids; and I had at no time the opportunity of administering anything, and could not get near her without causing spasms. She died next day, Sunday, 31st, having been sick about forty hours.

In regard to the manner of inoculation, I know of no other means than the following: About one year previous, a dog, belonging to the family, became rabid, and bit two calves; the dog died, and a short time afterwards both calves. One of the calves belonged to the cow which she was in the habit of milking, and my supposition is that the saliva of the calf came into contact with some part of the hand, which was abraded, and thence introduced into the circulation.

CASE 93. *Reported by Dr. C. W. Higgins, Abingdon, Ill.*

December 10, 1855. Called to see Zulick Clarke, the case to which you refer; found him laboring under well-defined symptoms of hydrophobia; made inquiries of the family, and found that on the 10th of November, 1855, he was bitten on the right hand by a cat, which he was obliged to choke off. He killed it immediately. At the same time his daughter, a little girl of 8 years of age, was bitten. The wound on his hand healed kindly, but that on the child suppurated and healed by granulation, and she has since felt no effects from it. The first symptom peculiar to hydrophobia, appeared on the 10th of December, about four weeks from the bite of the cat; upon interrogating his wife, found he had been irritable, and complained of a pain in and difficulty of using the arm; symp-

toms increased rapidly, until the 12th, 10 o'clock A. M., when death relieved him of further pain. Tried chloroform, which produced asphyxia. His age, 55; temperament, nervous-sanguine; residence, one-half mile north of this place.

CASE 94. *Reported by Dr. C. W. Higgins, Abingdon, Ill.*

Two other cases of hydrophobia have occurred in this place; one of a horse taken June 10th, 1855, sick about forty hours, died; do not know the manner of inoculation. During the attack he would attempt to bite everything that came within his reach; he succeeded in biting one man severely. I immediately cauterized the wound; no unpleasant effect has since been experienced from it.

CASE 95. *Reported by Dr. C. W. Higgins, Abingdon, Ill.*

The other of a cow taken about a month ago; lived twenty-four hours after the attack; know of no means by which the disease was contracted.

There is no dog law in operation in this vicinity.

CASES 98 and 99. *Reported by Dr. R. D. Mussey, Cincinnati, O.*

I have been called to witness two cases of this terrible disease.

1st. That of a girl 15 years old, bitten on the cheek by the family dog, not known to be mad. Six weeks afterwards she sickened, and died on the third day, with all the characteristics of hydrophobia.

2d. That of a young man; I do not remember where he was bitten, whether on the hand or leg, in July. Sickened the following February, and died the fourth day after the attack.

Should I again be called to a person bitten by a rabid animal, I should apply to the wound very freely the tincture of iodine; especially if the wound was on a part which could not readily be excised. My son has tried it in several cases of bites from animals supposed to be rabid; but inasmuch as not more than one in twenty of those bitten by rabid animals have hydrophobia, we cannot regard iodine as a sure prophylactic, without a far more extended experience.

CASES 102, 103. *Reported by Dr. Jno. W. Green, New York.*

Miss Bassett, æt. 11 years 11 months, bitten on the lip by a small dog, on or about the 10th April, 1855, was sent to New Jersey, where she underwent some kind of prophylactic treatment, and was

pronounced out of danger by the empiric officiating. Brought home, and on the 7th July, 1855, was attacked in the following manner:—

About 10 P. M., Saturday. Bolstered up in bed; great difficulty in breathing; constriction about diaphragm; pulse 120 to 125; tongue coated; difficulty of spitting, requiring great effort; nothing said about her having been bitten; almost impossible to swallow either liquids or solids; skin cool; eyes watery and staring; had a lump, as she expressed it, in the region of the heart; was induced, after much persuasion, to swallow a teaspoonful of sol. tart. ant. et potass. Sunday, July 8th, 9 o'clock A. M.; has not slept; obliged to stoop forward to breathe; tongue thickly coated; pulse 120; great difficulty in swallowing; antimony produced slight emesis during the past night; after midnight she refused to swallow; complains of pain about the right eye; could not bear to be fanned or have a current of air upon her; shudders, and has *spasms*, if paper is rattled near her, and requests that it be discontinued. 2½ P. M.; no better; springs out of bed, froths at the mouth, and endeavors to bite those standing around her; was induced by a physician who saw her, to wash her hands in cold water, which produced convulsions, and made her scream violently; has not slept. Monday, 9th, 8 o'clock A. M. Violent convulsions; hands thrown up above her head, when she attempts to free the mouth of the viscid saliva; almost impossible to control her, or prevent her from jumping out of the window; has had, at intervals, 12 drops tinct. belladonna, in two-drop doses, during the last eight hours. 2½ P. M.; quiet, and amused herself by looking at her books and pictures; relieves herself of saliva with less difficulty; dislike to fanning still continues; cannot go out doors; was more comfortable; conversed naturally with those around her. Could see water poured from a spoon without a spasm; would not drink or take nourishment, the endeavor so to do producing spasm; pulse 112; walked about the room; stirred lemonade with a spoon, but did not drink.

Tuesday, July 10, 6 o'clock A. M. Learned that at 11 o'clock last night she drank warm lemonade, and after slept an hour; ate this morning soft boiled eggs, soda crackers and tea; drank also lemonade. Tongue clean; pulse 120. At 7 A. M. washed her pet chicken's feet in warm water without a shudder. At 10 A. M. was moody and cross; wished to get out of sight. Head bent forwards, would not eat or drink, spit and bit at every one who approached; could not control herself; complained of pain along the course of the spine; great tenderness on pressure; unable to swallow; spasms

every two or three minutes; tried to bite. 8½ P. M. Eat bread and butter and drank tea from a saucer. Pulse 100, tongue clean, skin comfortably warm. Head inclined to the right side; quite cheerful; ate some strawberries brought by her medical attendant; went up stairs alone; shook hands with her friends who came to see her; did not complain of her back. Takes the tinct. belladonna at intervals; seems sleepy. Has lain in bed during the afternoon; drank a little wine and water. At 9½ P. M., she became delirious, at 10 was put to bed. The spasmodic action was very severe, "frothed at the mouth," and bit at her attendants. Rattling and choking in the throat. Tore away the clothing from about her neck. Head and body hot; her mother attempted to wet the head with cold water but found it increased the violence of the paroxysms so much as to oblige her to desist. After 12 at night symptoms all increased in violence; two or three men were required to hold her. She cautioned her father against coming near her, as she would bite him. At 3 A. M. she became blind; frothy saliva ran from her mouth. Continually she attempted to tear everything within her reach, and clawed at the air. At five minutes past 5 o'clock A. M., July 11th, she died; cadaveric rigidity came on within a few minutes. No post-mortem could be obtained.

The basis of the above is from a note received from Dr. Freeman.

Mr. Taylor, a patient of mine, residing at Morrisania, had two children bitten at the same time with the Bassett girl. As soon as she was attacked I had them sent away from the neighborhood; they were taken to Long Island, about seventy miles from their home, and kept until all the excitement natural to such cases had passed away. Neither of them so far has exhibited any hydrophobic symptoms, and, as you can see, it is now over fourteen months since the time of wounding. I shall keep them in view, and should anything occur will let you know. As to the Bassett case, I saw the patient myself, on Monday, the 9th, about 1 o'clock P. M. Found her sitting up amusing herself with her books and pictures. She appeared to me to be suffering from nervous exhaustion. She was wayward and expressed strong likes and dislikes to different persons; said she was glad to see me and would let me stay, but "that other man (alluding to another physician) must not stay." The only experiments I made were rustling paper near her and fanning her. The former produced great uneasiness, but no marked spas-

modic action. She turned to me and wished me to desist, as she said it made her feel badly. I then took up a magazine, engaged her in conversation, and with the right hand (I was sitting at her left side) which was hidden behind her chair, commenced to fan her gently and from a distance, as I brought the paper nearer she became more and more agitated, until when quite near, she grasped the fan, was slightly convulsed, and she turned in an irritable manner to me, saying: "Stop that, you are blowing on me."

I saw her again on Tuesday morning; found her in the garden attached to the house. She was walking slowly about being supported by her father; was told that she had drank lemonade and tea, and had eaten eggs, bread, etc.; her general appearance was still very bad; the last paroxysm was worse than any preceding one. The next day I received word that during the night she had had two paroxysms, and that death had closed the last one and her life at the same moment.

CASE 103. *Reported by Dr. Jno. W. Green, New York.*

I. B., a native of Ireland, æt. 30, was bitten by a small dog some time about the month of March. The wound remained open for six or eight weeks, when it cicatrized, to all appearance, soundly. Four months from this time he became careless (he was foreman in a large coal yard), listless, and was frequently reproved by his employer, who did not suspect the cause. The day of his seizure he, in company with some of his friends, entered a saloon and called for beer; taking up the glass, he found he was unable to get it to his mouth, and finally was obliged to give up, notwithstanding the laugh on the part of his companions. He returned to the yard, appeared very ill, and was sent by his employer to see Dr. David Green. He did so. Dr. Green supposed, from his symptoms, that he was laboring under the after effects of a "spree," prescribed for him with this idea, and was to call at his house in the evening. Upon calling at night found him restless, and walking the floor; was told he could not take the medicine prescribed, nor could he swallow any fluid, the mere act of offering it to him produced a shudder. The Dr. then questioned him particularly as to his having received a scratch or puncture from a nail or other instrument, and was told immediately that he had been bitten by a dog, sick at the time, and that he had killed it. He was urged by Dr. Green, who was then convinced of the case being one of rabies canina, to send for his usual medical adviser, who lived at some distance.

This was complied with, and the two physicians met late the same night. Every argument and all means were used to induce him to do something; but it was useless. He declared that it was unnecessary, there was no hope for him, he must die. The nervous disturbance increased; he could not sleep, was very restless, asked his employer to procure straps and confine him, should he be seized with convulsions, in order that he might not injure those about him. At 11 o'clock the next morning was attacked by a convulsion; four or five strong Irishmen seized him, threw him upon the bed, face down, and from fear of injury kept him there till the spasmodic action ceased; when they loosed their hold the patient was dead!!

During my travels in the East, I ascended the Nile nearly to the second cataract. The mud villages which adorn its banks are densely populated by a race of curs that seem to have little in common with the dog, as we are acquainted with him, except in name. It being a vulgar idea that heat is one of the exciting causes of madness in this animal, and as Egypt and Nubia are in such close proximity to the equator, I was struck with the idea that this would be a favorable spot for the origin of rabies. Although I made frequent inquiries, sometimes daily, I failed to become acquainted with one fact of the kind. The disease seemed to be entirely unknown.

In Turkey also, as is well known, there are large numbers of dogs which run wild about the streets. The Turks consider them unclean, and are not to be persuaded to touch them, yet they never injure them, but will throw them food at times. They are very ferocious, and yet cowardly. Should by any chance a strange dog make his appearance upon the quarter already occupied by two or three others, they will at once fall upon him, and tear him to pieces. It is told as a fact at Constantinople that a gentleman confided a valuable pointer to a servant for the purpose of having him exercised. When the servant returned, upon being asked what he had done with the dog, held up in answer his hind leg, which, he affirmed, was all he had been able to save of the unfortunate animal. At night it is dangerous to go about the streets without arms or a stout stick, as well as a lantern, for there are numerous instances where persons have been attacked while walking quietly along. Yet, with all this disposition to become irritated, I was unable to find a single case where rabies had ensued from their bite.

CASE 104. *Reported by Dr. W. L. Atlee, Phila., Pa., June* 20, 1856.

Some time ago I promised you some notes of a recent case of hydrophobia, and in order to make them more perfect I wrote to the physicians, whom I met in consultation, to aid me. I have as yet received no answer, but fortunately my young friend, T. M. Drysdale, M. D., had made some notes of the case, which he has had the kindness to hand me. He is a most accurate and reliable observer.

I first visited Mr. J. L., æt. 54, Sunday, September 2d, 1855, in consultation with Drs. C. and G., and found him laboring under unmistakable evidences of hydrophobia. I at once proposed tracheotomy in connection with other active means. It was, however, deferred until next day, when I visited him again in company with Dr. Drysdale; prepared to perform the operation, but this was peremptorily refused by the patient and friends. Since my first visit he had been tranquillized for a couple of hours by the inhalation of my mixture of chloroform (one part), and ether (two parts), but was now more excited than ever. The following is a copy of Dr. Drysdale's notes:—

"Case of J. L., æt. 54, *Sept.* 3, 1855. The patient was bitten in the right hand by a small strange dog, in May last, but enjoyed health until last Thursday, August 30, when, after rowing a boat, he was seized with severe pain in the bitten arm, the pain darting to the cervical regions, where it was particularly severe. The next symptom which attracted his attention was the difficulty of deglutition. This he first noticed in attempting to swallow a dose of Epsom salts, which a druggist had prescribed for him.

"Dr. S. was consulted, and, although the man was but a moderate drinker, treated the case as one of delirium tremens. The family being dissatisfied, Dr. S. was discharged and Drs. C. and G. were called in. At their request Dr. Atlee was sent for, who found the patient in this condition: Agitated and irritable; when a glass of water was offered him, he was seized with spasms. Spasms were also produced by blowing suddenly in his face.

"At 12 M. I accompanied Dr. A. to assist him in opening the patient's trachea. We found the patient walking about his garden, speaking rationally, and answering any questions put to him; but his manner was restless, and when Dr. A. desired him to tell where he had been bitten two years before by a *raccoon*, he at once lost self-control and became furious, refusing to allow any one to speak

to him. After a time he grew calm, and Dr. A. told him what he proposed to do, but he refused consenting to any operation.

"The night before he had been very violent. He could not swallow anything while we were present, although he made strong efforts. A blister had been applied over the spine, and the denuded surface dressed with morphia and lactucarium. Dr. Atlee recommended the use of enemata of beef tea, with full doses of morphia, and the mixture of chloroform and ether to be inhaled.

"*Sept.* 4. Dr. Atlee sent word to me that Mr. L. was dead, and the family desired a *post-mortem* examination. Accompanied by Drs. Fleming and Jackson, I went to Mr. L.'s, where we met Dr. C., who gave us the remaining history of the case, as follows: After our visit yesterday, at about 1 P. M., he became exceedingly violent, and towards evening ran out of the house, across the street and home again several times. He now desired intercourse with his wife, which could only be prevented by removing her from the house. Dr. C. attempted to apply the strait-jacket, but failed, as his assistants were not strong enough. At night he became so violent that it was found absolutely necessary to use restraint, and Dr. C., with eight assistants, managed to get on the strait-jacket. It was now observed that his pantaloons were stained as if with semen, and when the patient attempted to urinate the penis was seen to be in the state of erection accompanied by all the signs of involuntary emissions.

"He accused the Dr. of having had intercourse with his wife; became convulsed, and, after foaming at the mouth, died insensible at 10 o'clock this morning.

"5½ P. M. Sect. Cad. Pharynx very much congested; larynx slightly inflamed, and together with the trachea covered with a tough froth, about one-fourth of an inch thick; the glottis was closed; abdominal organs healthy. This was all the examination permitted."

CASE 106. *Reported by Horace Manley, M. D., of Richfield Spa., N. Y.*

Joseph Bell, of Columbia, N. Y., 35 years of age, a tanner. Habits somewhat intemperate, but laborious in the discharge of his duties, and generally of sound health. On the 5th of October, 1836, he was bitten on the thumb by his own little dog. His son, 11 years of age, and daughter, 13, were bitten at the same time by the same dog. Five or six dumb beasts were also bitten, and died from

hydrophobia. The son was attacked with hydrophobia on the 12th of June, 1837, and died in two days. This case I did not witness. Mr. Bell himself was attacked on the 16th of June, two days after the death of his son, with evident symptoms of hydrophobia. The symptoms and treatment here given are taken from notes made at the time by myself and my friend, Dr. Griffith.

The first evidence of disease was a violent headache on rising from bed; he, however, went to his work in the tanyard as usual, and in an hour appeared to be occasionally in deep study, and at times would start up affrighted, as if he thought something was about to fall on his head. In about an hour more, he flew out of the tanyard, leaped over his garden-fence, stopped suddenly in the garden, threw away his cravat and hat, ran about twenty rods, and again stopped, and stood musingly, as before. He soon ran again, and attacked the stump of an old tree, and tore it with violence. He continued running and standing alternately until he was apprehended, say about 10 o'clock A. M. The *sight* of water would invariably bring on a paroxysm of distress, and an attempt to *swallow* water would bring on a spasm of the throat, followed by violent raving; when the paroxysm was over, he was quite rational, and would warn his friends to beware of him, as he certainly should injure some of them.

At this period, or rather as soon as I was satisfied the case was one of hydrophobia, I sent for all the physicians in our vicinity, to wit: Drs. Hannah, Griffith, Ethridge, Palmer, and Doolittle. The first four were soon in attendance, and three of them concurred with me in opinion that the disease was hydrophobia. Dr. Ethridge thought it was delirium tremens, but all agreed that they knew of no certain remedy. I proposed to try a *vapor bath* (he had already been bled 30 ounces), and they all consented. Accordingly, steam was got up, and we kept him under a temperature of 140° Fahrenheit for four hours; sweating came on in half an hour, and when one hour had passed, we tried him with fluids. Water he could not yet bear, but swallowed a little sage tea, colored with milk. His thirst was excessive, and we now gave drink often, and the perspiration flowed profusely. After the sweat started, the spasms abated in violence and frequency, and by 9 P. M., he fell asleep, and during the night slept probably five hours. This process was followed for four days, that is, the heat was kept high enough to keep up some perspiration, and when any signs of a returning

paroxysm was noticed, we raised the heat till the sweat flowed more freely.

17*th*, 7 A. M. Horrified at the sight of water, but thirst abated, and he professed to be getting better; thought he could go to work. At times appeared flighty, and when the subject of the bite and other circumstances of his case were talked of was agitated. He sighs often. An injection of salt and warm water was administered, which operated three times; evacuation dark and fetid; urine abundant, and deposited a sediment. Complains of *pain in the penis, which looks purple;* sweet oil applied, and pain abated. Tried to eat toast, but could not; drank during the past night a pint of water and a quart of sage tea; heat raised to 80, with relief.

1 P. M. Symptoms improving; complained of slight pain in the seat of the bite; slight throbbing, extending to the axilla.

18*th*, 9 A. M. Slept well; eyes less red; no sighing; had no pain except in the thumb, the seat of the bite; talks freely about his case without agitation. When water was presented, said he could swallow it, but when the tumbler was handed to him, he rose and approached it obliquely to the right, and then to the left. He now began to shake violently, and attempted to swallow it suddenly, but failed, choked, and averted his head; tried again and failed; flung himself on the bed very much agitated; his eyes rolled wildly; breathing became laborious; sighed deeply, and the headache returned. The temperature was now raised to 80 again, and an injection of salt and water administered.

12 M. Temperature continued at 80 till 10 P. M. More quiet; perspiration profuse; discharged considerable saliva of thick consistence; evacuations more natural; pulse 75, soft and equable; sighs not so often; thirst moderate.

19*th*, 6 A. M. Improving, rested well; took him out of bed, and walked into the next room; says things and people look more natural. Dismissed cured!

Mr. Bell is yet alive and well (10th April, 1856).

Dr. Doolittle, of Herkimer, did not see him till the second day, when his case was quite changed. He reasoned syllogistically, and said that hydrophobia was a *fatal disease;* Mr. Bell was convalescent, therefore Mr. Bell had not hydrophobia.

REPORT

ON THE

CAUSES WHICH IMPEDE THE PROGRESS

OF

AMERICAN MEDICAL LITERATURE.

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To write a report on the causes which impede the progress of American Medical Literature is no easy task. It requires labor, thought, judgment, courage. It is environed by many difficulties; it involves serious responsibility. On the one hand, I find that the labor is much greater than I had anticipated; and, on the other, that it is almost impossible to discuss the various topics embraced in it without incurring the risk of exciting displeasure, or of having my motives and feelings misapprehended and misrepresented. While I do not shrink from the former, I sincerely hope and trust that I shall escape the latter. While I shall present my views with great freedom, nothing is further from my intention than a desire wilfully to wound the feelings of a professional brother, or to cast any unjust reflections upon our medical schools, our medical press, and our medical charities. Duty, however, to this body, not less than to myself, requires that, in my attempt to unfold the causes under consideration, I should speak "the truth, the whole truth, and nothing but the truth," in regard to every subject which comes legitimately within the province of this report. My motto shall be, "My country first, my profession next."

Have we a national medical literature? If so, what are its nature and extent?

It requires no labored argument to answer these questions. Undoubtedly we have a national medical literature; but that its character and extent are not what they should be, or what we hope they ultimately will be, is equally true. It is an immature, an infantile literature, destitute of bone, and muscle, and sinew, gradually but steadily developing itself, and destined, ere long, to take its

place by the side of that of other nations. Literature, regarded in the abstract, has, like the arts and sciences, nay, like governments and nations, its rise and progress, its trials and difficulties, its prosperity, its decline, and its downfall. It does not, Minerva-like, spring in full vigor and perfection from the brain of the heathen god. It does not send forth its rich and fertilizing influences at once upon a people. Its ascent is gradual, its growth tardy, often, indeed, almost imperceptible. To this rule the medical literature of the world forms no exception. What it is, and what it has been, it has become by slow degrees, by hard labor, by indomitable zeal for the national welfare and the national honor. The medical literature of America was conceived in adversity, rocked in the cradle of sorrow, and reared on a diet of bread and water; and yet, as will appear by and by, it is not destitute of value to the possessor, or without honor to the giver. Young as it is, and beset as its progress has been, and still is, with trials and perplexities, it is as a living fountain to our profession, from which all who thirst may drink and be refreshed; as a mine of precious ore, abounding in the golden sands of science and erudition. If it lacks the stately proportions of the medical literature of some of the more refined and cultivated nations of Europe, it possesses the vigor of a healthy and steady growth, surely, though slowly, advancing to the full maturity of a sound and sturdy manhood.

When we reflect upon the history of our country, its long dependence upon a foreign power, its struggles for liberty, and the vast toils necessary for the maintenance of its political existence, we are not surprised that its medical literature is still in its infancy, but that it should have any medical literature at all. Ages elapsed before England, France, Germany, and Italy, the most favored, learned, and scientific nations of the Old World, had even made a beginning in medical authorship. The medical literature of Great Britain dates no further back than the time of Harvey and Sydenham, in the early part of the seventeenth century. Until the appearance of those illustrious men, the pride and glory of English medicine, England had no medical writers who survived the generations of which they formed a part; and, even for a long time subsequently, she hardly produced a solitary work which is now remembered except by its title. Richard Wiseman was her first great surgical author, and generations passed away before she produced a Pott and a Hunter. In anatomy, physiology, chemistry, materia medica, medical jurisprudence, toxicology, obstetrics, and

practical medicine, she had literally no great works until the commencement of the present century. In pathological anatomy and general pathology she has not even yet a solitary treatise worthy of her noble profession. The same is true, though not in an equal degree, of the medical literature of some of the other nations of Europe.

During our colonial existence, medical literature and medical science made no progress. The clerical and legal professions were much more ably represented than the medical. The religious persecutions of Europe induced some of the most able and learned divines to forsake the Old World to seek an asylum and a home in the New. They brought with them their piety, their zeal, their erudition, and their enterprise, which they devoted, without stint, without money, and without price, to the service of the church, of education, and of literature. They became the founders of some of our most valuable and distinguished literary institutions, and the authors of eminently creditable works on theology and history. The most important judicial offices were held by men of learning and legal acumen, sent hither by the British crown; and many of the governors of the different provinces were Englishmen, distinguished for their literary and scientific tastes and attainments. The medical profession, on the contrary, was at a low ebb. It had no antecedents, no present, no future. The country, until a short time prior to the revolution, held out no inducements to the refined and educated physicians of Europe, to seek their fortunes in the wilds of the new world. Sparsely settled, overrun by the Indian and the panther, destitute of roads and bridges, so necessary to the comfort and convenience of medical practitioners, and frequently visited by epidemics, as terrific as they were obscure and unmanageable, it attracted to its shores none but daring adventurers, little skilled in the art of healing, and still less disposed to engage in its exercise. Other avenues were more alluring to their ambition and their avarice. Nor were the native physicians in a condition to build up and sustain a medical literature. In the absence of medical schools, it was impossible for them to obtain an adequate medical education, except by going abroad, which few of them, in the then existing state of things, had an opportunity of doing. The consequence was that, until about the middle of the last century, few physicians of science, learning, or great respectability were found in the colonies. The first American medical college was erected in 1763; and, although another was soon added, yet both

were compelled to close their halls during the Revolution; nor was any attempt made to revive them until after the establishment of peace in 1783. Up to this period, and, indeed, until shortly after the commencement of the present century, hardly any work, deserving of the name, had appeared on medicine from the pen of a native physician. The most valuable treatises then extant were Bard's *Midwifery* and Jones's *Surgery*, both greatly esteemed in their day on account of their practical character.

It cannot be supposed that a nation, fresh from the hands of God, and just emerging from a long, bloody, and desolating war, would be in a fit condition for the cultivation of the arts and sciences. Its time was fully occupied by more important business, the pursuits of agriculture and the mechanic arts, and the solution of the great and vital problem of self-government. It had to supply the means for the necessities of the body rather than for the necessities of the mind. Its citizens had no leisure for writing books, painting pictures, or fashioning men out of marble. God, the great architect and chemist of nature, was their only artist. They were in a transition state, unable satisfactorily even to foresee their own destiny, but gradually clearing away the stumps and rocks of their mental soil, to fit it for the reception of the seed which has since been sown, and which has produced such noble fruitage. They were preparing the way for those great and astounding enterprises, which, while they have enabled them to tie together the beams and joists of the republic with cords of adamant, have secured for them a strong and abiding rank among the nations of the earth. They were occupied in infusing into each other a love of country, and into the different professions a love of research and a spirit of kindness, which, we trust in God, will continue to animate their successors in all time to come. In a word, they set each other in motion, and gave each other a proper impulse and a proper direction, and thus infused a quickening, vitalizing influence into the national mind.

Under the genial influences here described, a more auspicious day soon began to dawn upon our country. Literary and scientific institutions sprang up, as if by magic, in every section of the youthful Union; the sword was transformed into the ploughshare, the pruning knife, the sickle, and the pen; men began to take a long breath, and to sigh for the labors of the closet; the spirit of composition descended upon them, and thus was gradually laid, in a broad and substantial form, the foundation of a nation's literature. In this general upheaving of the mind, this outburst of

science and of letters, the medical profession largely participated, as it had previously in the great struggle for American Independence. Medical institutions, medical societies, medical charities, and, finally, medical periodicals, sprang up in every direction, and afforded employment and labor for the best intellects of the day. As a necessary result, book after book has appeared, until we shall soon cease to be able to count them.

The early part of the present century supplied us with the writings of Rush and Barton, the *System of Anatomy* by Wistar, Dorsey's *Surgery*, so long used as a text-book in the University of Edinburgh, Chapman's *Therapeutics and Materia Medica*, Coxe's *Dispensatory*, Thatcher's *Practice of Medicine*, and several other productions of minor note. As yet, the profession had not produced one solitary great work on any subject. Then appeared, in pretty rapid succession, the valuable treatises of T. R. Beck, Gibson, Dewees, Horner, Eberle, Hare, Silliman; and, at a still later period, those of Dunglison, Wood & Bache, N. R. Smith, Meigs, Wood, Dickson, Oliver, Paine, Condie, Bell, Warren, Stewart, Ray, Gerhard, Bartlett, McClellan, Pancoast, Morton, Miller, Mitchell, Frost, Henry H. Smith, and others. The last few years have been unusually prolific in valuable monographs, as is exemplified by the publications of the younger Meigs, the two Stillés, Swett, Carnochan, Frick, Drake, and La Roche, the last two of which may justly be regarded as forming an epoch in the literature of the profession.

If the preceding statements be true, no one acquainted with the subject can accuse the profession of the United States, of the present day, either of lethargy, idleness, ignorance, or indifference. The numerous works which annually issue from our press, the existence of forty medical periodicals, nearly all of them respectably if not ably conducted, and the successful operation of nearly forty medical schools, which annually send forth upwards of one thousand graduates, all attest, in the strongest possible terms, the zeal, the learning, the intelligence, and the enterprise of its members, and afford a guarantee that its great interests are safe in their hands. Considered in its aggregate capacity, it unquestionably comprises a greater amount of talent, erudition, science and activity than any other of the liberal professions in America; thus nobly reversing the order of things, in regard to these professions, which existed prior to the Revolution.

Having made these remarks, which seemed to me to be necessary to a more perfect appreciation of the main subject of this report, I

shall proceed to inquire into the causes which still obstruct the progress of our national medical literature, and close by making a few comments on the remedies which, in my judgment, are necessary for their successful removal. These causes, although numerous and diversified, may be grouped under four principal heads: 1. The identity of the language of this country with that of Great Britain. 2. A disposition in the profession to patronize English works in preference to American. 3. A want of independence in our periodical press. 4. A lack of industry in observing and recording facts in private and hospital practice. Let us examine these points somewhat in detail.

1. One of the great disadvantages, as it respects the present subject, abstractly considered, under which the people of the United States are and have been laboring, is the circumstance that they speak the same language as the inhabitants of Great Britain, from whom, as from a common stock, they originally descended. It follows, as a natural consequence of this identity of language, that they should feel a deep interest in the writers of that country, and a strong desire to become acquainted with their works, either by direct importation of them or through the medium of American reprints. As English books are very costly, on account of the heavy duty imposed upon them by government, the latter method is the one usually adopted. To so great an extent, indeed, does the practice obtain, that, for many years past, every English work of any note or merit, real or fictitious, has been issued on this side of the Atlantic within a very short period after its publication at home. This is true of every species of literature, general, medical, theological, and legal; so that, if we had no native authors, the American mind could hardly suffer for the want of proper nutriment from this cause, so abundant and diversified is the foreign supply. The republication of British works has, for nearly half a century, been a source of constant occupation with some of the best firms of the Atlantic cities, affording a safe and profitable investment for their capital, and steady employment to many thousand persons. The business has, in fact, grown into a great and flourishing trade, requiring millions of dollars for its prosecution. Some of these firms have amassed great wealth, derived from no other source. In the absence of an international copyright law, securing to every author a just compensation for his labors, the works thus furnished are generally sold at less than one-half of the price of the English editions; and hence it often happens, both in medicine and in other

departments of learning, that they have a much wider circulation here than at home. Sometimes, in truth, English works, neglected or imperfectly appreciated in Great Britain, are, perhaps, for the first time, fairly introduced to the notice of the public by and through the American press. It was thus with the writings of De Quincey, which were first collected and issued in a uniform edition by a publishing house at Boston. Dr. Stokes' *Lectures on the Theory and Practice of Physic* met with the same courtesy at the hands of a Philadelphia firm, having prior to this not even appeared in book form, but being safely locked up in an Irish periodical, published at Dublin. A number of other works, having a very limited circulation at home, have been largely read in this country. Mr. Fergusson's *Practical Surgery*, for example, has passed through at least one edition more in America than in England; and a similar compliment has been extended to another meritorious work, Watson's *Practice of Medicine*. Such marks of attention must, even in the absence of copyright remuneration, be extremely gratifying to the authors of Great Britain; but the force of the compliment is weakened when it is recollected that these reprints are made indiscriminately, and therefore without any special reference to their intrinsic merits. In a word, they are made simply because they serve to fill the pockets of those who incur the responsibility of becoming their sponsors. If they were obliged to purchase the copyright at a fair value, the number of American issues of British works would be far less than it now is. It is owing to this circumstance, one of the most remarkable anomalies of our age and country, that the literature of the United States exhibits, even at the present moment, more of a foreign than of a domestic aspect, the number of English works circulated among us being greater than the number of native productions.

It cannot be denied that this practice of republication is of great advantage to the public; for it serves to diffuse among the people, in a cheap and accessible form, a vast amount of knowledge that would otherwise be beyond their reach. It brings the works of our transatlantic brethren directly to our doors, at the same time that it serves to extend the name and fame of the authors. But, while it accomplishes all this, it unfortunately interferes, in the most positive manner, with the establishment of our national literature, considered in its widest as well as in its professional sense. It depresses native talent, native genius, native aspiration and enterprise. It narrows the road of authorship, and besets it with obstacles and

difficulties almost insurmountable by ordinary means. The man who attempts to scale it must do so at the risk of a long probation, without the prospect even of much ultimate pecuniary reward, when his reputation shall have been firmly established by the product of his pen. When his literary labors are completed, and he places his MS. into the hands of his publisher, should he be so fortunate as to find one, he is pretty sure to be informed that there are already before the public so many works on the same subject as to render the success of his own too uncertain to justify the offer of a stipulated sum for the copyright of the first edition. Should the sale go off well, he may ultimately receive a few hundred dollars for what ought to have brought so many thousand, if the book had no foreign competitors in the form of reprints. In short, he finds his only recompense and solace in the prospective fame of his literary labors. I do not now speak of the novelist, the poet, the tourist, and other writers of light literature, who always find readers, however trashy their productions, but of men of science and letters, the solid and substantial authors of a country. These men must be encouraged, patronized, and sustained in their efforts to improve the literature of the nation, and thus advance its honor and glory. If it be said, in reply to these remarks, that every work must stand on its own merits, we do not perceive the force of the rejoinder. If the market is already glutted with foreign productions, it must be obvious that the wants of the public are, at least in part, if not fully, supplied; and hence the native work, however meritorious, must labor under the disadvantage of a degree of competition, which, especially if we consider the additional disadvantage of its higher price, may throw it into the shade, or altogether prevent its success. If, for instance, an American physician were to write a work on surgery, his success would be sure to be tardy, because the country is already flooded with foreign treatises; and so in regard to most of the other departments of the profession, as well as of literature in general. If the people of Europe spoke but one language, and there existed no international copyright laws, there would be comparatively few authors of any kind; the necessity for writing would be much diminished; the same book would answer for all; and men of literary taste and attainment would seek other channels for the exercise of their talents. But such is not the fact. Every nation has a distinct and separate language; a distinct and separate literature. The works of Sydenham and Harvey, of Van Swieten, Bichât, Haller, Baglivi, and Scarpa can be read out of their

own countries by the mass of the profession only through the medium of a translation. Speaking, as we do, the same language as the people of Great Britain, and republishing, as we do, at pleasure any of their works that come within our reach, Shakspeare has more readers by ten to one on the shores of the Ohio than on the banks of the Avon.

2. A second cause of impediment to the complete and satisfactory establishment of a national medical literature is the disposition, more or less strongly felt and evinced by the profession, to patronize foreign works, especially English, in preference to our own. On this subject no doubt exists. The disposition is exhibited constantly and in a variety of ways, as will be seen as we proceed with the discussion of the subject.

In the first place, the fact here mentioned is evinced, most unequivocally, by the use which is made of foreign works as text-books in our medical colleges and universities. Of the forty schools which at this moment exist in the United States, there is not one which, so far as my information extends, confines itself exclusively to American works. In a number of them, indeed, hardly any other than English are employed; and frequently, even when American are recommended, it is done in such a manner as clearly to indicate a preference for the former. Even in the Jefferson College, Philadelphia, most of the members of whose Faculty are authors, several foreign works are mentioned in the list of text-books. In the institution with which I have the honor to be connected, the principal text-books, until recently, were Wilson's and Quain's *Anatomy*, Carpenter's and Kirkes's *Physiology*, Liston's *Surgery*, Chaillié's *Midwifery*, Ashwell's *Treatise on the Diseases of Females*, Pereira's *Materia Medica*, Watson's and Stokes' *Practice*. By a resolution of the Faculty, in 1854, it was agreed that, thenceforth, no European publications should be recommended to our pupils as text-books. So far as I am informed, this is the only American School in which such an attempt has been made, although even here it has not been strictly carried out.

Of the many strange and unaccountable things which characterize the present times, in this country, that of using foreign works as text-books in our medical schools is one of the most extraordinary. The fact implies, clearly and unmistakably, that American teachers have either no confidence in American authors, or that they are sadly deficient in genuine patriotism; or, what is still worse, and more to their shame, that they are influenced, in their

conduct in this matter by feelings of jealousy and avarice; afraid lest, by recommending to their pupils the works of their countrymen, their pupils should chance to discover that their countrymen can write books; afraid lest, by giving them this information, their pupils should stray off, and patronize the schools of which so many of these authors are members. If these are not the true reasons of this conduct, so disreputable to our profession, to our country, and to our age, I confess my ignorance and my inability to assign any other.

During our colonial existence, and for more than a quarter of a century after the American Revolution, which severed that existence, we were necessarily dependent upon England for all our literature, medical as well as miscellaneous, and the debt thereby incurred forms no small item against us; but the time has gone by when we require such assistance, and it is, therefore, clearly our duty to declare ourselves free and independent of our transatlantic brethren, as we did eighty years ago declare ourselves free and independent of the British crown. To continue longer in our vassalage is as incompatible with the genius of our government, as it is disgraceful to us as men and physicians. But, while we endeavor to perform this duty, a duty in which all true patriots in the profession should cordially unite, let us not forget the debt we owe to the mother country, but use our best exertions to reflect back upon her the light of science and of literature from our own. The thoughts and the actions of her great men, as expressed in their writings, have been, for generations, a portion of our daily intellectual nutriment.

In the infancy of a nation which has no resources except the virtue of its citizens, and a doubtful tenure upon its soil, men are often forced to do that which, under opposite circumstances, would be repugnant both to their pride and to their patriotism. It was thus with our forefathers in regard to the adoption of foreign works as text-books in our seminaries, colleges, and universities; the exigencies of the times forbade any other course. And it was thus with Mr. Jefferson, when he was engaged, in 1819, in organizing the University of Virginia, which he afterwards fostered and protected with the care and affection which a fond and doting parent bestows upon his favorite offspring. Anxious to fill its various chairs with none but able men, he scanned with a scrutinizing eye the claims of his own fellow-citizens, determined to give them the preference over foreigners, provided they possessed equal or greater merit in

their respective departments; but to seek his teachers abroad if they possessed qualities superior to native Americans. Dr. Bowditch, who stood at the head of the mathematicians of the United States, having declined the chair of mathematics, it was tendered to and accepted by Mr. Bonnycastle, an Englishman. Dr. Dunglison, also an Englishman, was invited to the chair of medicine, and Dr. Emmett, an Irishman, to that of chemistry. At present, all the chairs of that celebrated university, at least as respects its medical department, are occupied by native-born citizens. This is as it should be. In the infancy of the institution the course pursued by Mr. Jefferson was eminently proper; his object was to build up a great seminary of learning and of science, and to place it at once upon the best and surest foundation. This object accomplished, the importation of foreign professors ceased, and Americans now occupy their place.

To institute a comparison between the medical authors of the United States and those of Great Britain, or, what is the same thing, between their works, hardly comes within the scope of this report; but I may be permitted to refer to a few of our native treatises as worthy of being employed as text-books in our medical schools. To begin, where is there, it may be asked, in the English language, a medical dictionary at all comparable with that of Professor Dunglison? or a treatise on physiology superior to that of the same distinguished author? Since the days of Haller, I have hardly seen a more learned, systematic, or comprehensive treatise on the subject in any language, certainly not in the English. It is all that such a work should be for the pupil and practitioner; plain, simple, perspicuous, and perfectly methodical, with an amount of erudition as rare as it is profound and astonishing. Our works on anatomy are amply sufficient for all the purposes of the class-room, for which they have all been employed, to a greater or less extent, by some of our schools. The system of Wistar has maintained its place in the esteem and affection of the American student for nearly half a century, and, with the emendations and additions of Professor Pancoast, bids fair to hold out half a century longer. Horner's treatise has passed through numerous editions; and the works of Morton, Richardson, and Handy are, in every respect, superior to that of Wilson, which figures so conspicuously upon the catalogues and annual announcements of our colleges. In practical medicine we have just cause to be proud of the labors of Eberle, Wood, Dunglison and Dickson, to say nothing of those of Hosack, Dewees,

Thatcher and Bell, the latter of which, however, is too much mixed up with that of Dr. Stokes to give it a national air. In materia medica and therapeutics, the treatises of Chapman, Eberle, and Dunglison, have long been held in the highest esteem. The second of these works was honored, soon after its appearance, with a German translation, and its author with a membership of the Medico-Chirurgical Society of Berlin. The treatise of the late Dr. John B. Beck, a more recent production than any of the above, is, I conceive, a model for a text-book; clear, graphic, concise, yet sufficiently comprehensive for all possible purposes to which such a book can be applied. In obstetrics we have the admirable and original works of Dewees, Meigs, and Miller, which all enjoy a European reputation, and a wide appreciation at home. On the diseases of children, the treatises of Eberle, Condie, Stewart, and Meigs are without rivals in the English language. In medical jurisprudence there was no work, until recently, that was at all equal to that of T. R. Beck, the merits of which have been acknowledged even in Great Britain by several reprints, and in Germany, by at least one translation. The recent production of the late lamented Moreton Stillé, on the same subject, is destined to attain a high rank in the medical literature of the country. The dispensatory of Wood and Bache is, beyond doubt, the most able work of the kind extant. If we have no great treatises on surgery, chemistry, toxicology, and some other subjects, is it to be supposed that we are incapable of supplying them? Certainly not. What has been done for the other departments of medicine may assuredly be done for these. We have the power; it is only necessary to exert it. Ages elapsed before Great Britain produced one solitary great work on surgery, obstetrics, practical medicine, toxicology, chemistry, medical jurisprudence, and anatomy. The Universities of Oxford and Cambridge had existed for centuries before she even began to dream of a national medical literature. She has not even yet anything like a great medical and surgical dictionary, one to be compared, in point of extent and erudition, with those of France and Germany. In descriptive anatomy, until the appearance of the treatise of Mr. Quain, only a few years ago, she had never furnished one great, respectable, or reliable work; and in materia medica, toxicology, juridical medicine and obstetrics, she was equally destitute. In operative surgery she has produced nothing equal to the elaborate and beautiful work of Dr. Pancoast, with, perhaps,

the single exception of that of Mr. Fergusson, so well known and so highly appreciated in this country.

If we turn our attention to specialties, we have no reason to be ashamed of our labors. The monographs of Gerhard, Swett, and Austin Flint; of Warren, N. R. Smith, and Carnochan; of Ray; of Bell; of Bartlett, Barton, Drake, and La Roche; are highly meritorious, and eminently creditable to the country. The two latter evince an amount of research and erudition which have no parallel in English medical literature.

With regard to American periodical literature, it is but justice to say that it is entitled to the highest praise. In point of extent, variety, and practical value, it is unequalled by that of any other nation. Nearly forty presses are employed in its service. Many of the best minds in the country contribute to its pages. If it be true that it is not all equally respectable in matter, taste, and style, enough is left, if we deduct the bad from the good, to satisfy the most fastidious, and to supply, in the most ample manner, the wants of the profession. The matter thus furnished, much of which is never seen by our transatlantic brethren, forms many volumes annually, and contributes, perhaps as much as anything else, to edify and enlighten the profession of the United States. It constitutes, indeed, a most valuable source of information.

From the preceding facts, and the observations founded upon them, it will be perceived that, in most of the departments of the healing art, we have laid a deep and solid foundation for the superstructure of a permanent national medical literature. We have seen that there is no need of borrowing books from Great Britain as text-books for our medical schools; we have shown that many of our writers are men of great talents and erudition, wielding a ready and prolific pen; and we have endeavored to prove that it is due to them, to us, to our profession, and to our common country, to declare ourselves free and independent of all foreign nations, as it respects the elementary instruction of our pupils.

Let us not be misunderstood. We would lay no embargo upon foreign works, or in any manner, form, or degree, disparage their merits, or discountenance their just claims upon the favor and patronage of the American profession. Literature, the arts and sciences, are cosmopolitan, acknowledging no "pent up Utica" as their home. Like the breezes of heaven, which fan and fertilize the earth, and refresh its laborers, they belong to no country and to no age, but to the whole world and to all time. We need no in-

ternational copyright laws; let there be a free interchange of our intellectual products; let us not place upon them any restrictions, as we do upon calico and other articles of manufacture. The time will come, if it has not already come, when the medical profession of Great Britain will be glad to receive, in par exchange, the results of our mental labor for theirs.

Intimately associated with this branch of the subject is another, hardly of less importance than that just discussed. I allude to the editing of British works by American physicians. So common is this practice that it now amounts to a trade. Pursued by young men and old men, men without reputation and men with reputation, it has become a crying evil, an evil which is directly instrumental in fostering and protecting British influence to the detriment of American authors. The main object of this practice generally is not to enhance the value of the reprint, but to promote its circulation by imparting to it somewhat of an American air. The book is indorsed, and it accordingly goes before the profession under a new prestige. The name of the editor is supposed to be a guarantee for its excellence; it serves the same purpose to the work that a letter of introduction serves to a traveller. It secures it notice; perhaps a cup of tea, and a permanent home. In this manner it often happens that works, destitute of real merit, or which fall stillborn from the British press, meet with a wide and rapid circulation in the United States, to the injury of deserving native authors, and the detriment of our medical literature. For fifty, a hundred, or two hundred dollars, men may be found, in almost every portion of the land, ready and willing to lend their aid and support to what the English press so constantly denounces and stigmatizes as literary piracies. What is remarkable, is that this kind of labor is often much more remunerative than the authorship of original works, which, as is well known to those engaged in it, is seldom adequately rewarded on this side of the Atlantic.

Now, I do not, as has been already seen, object to the republication of British works, but I do protest, and that in the strongest terms, against this practice of editing them by members of our profession. Let these works stand on their own merits; it is due to their authors at least that they should not be mutilated and disfigured with notes, annotations, and alterations. If they possess intrinsic merit, they will be sure to find their way into the profession, and to receive the favor and patronage to which they are entitled. If they do not, let them fall, as they deserve, stillborn

from the American press. But whatever may be their fate, let us discountenance the humiliating custom of affixing our names to their title-page, and of ushering them into notice under the seal and sanction of our influence. If the diseases and accidents of Great Britain were different from those of this continent, and, above all, if they required a different or modified treatment, then there would be some show of reason for this practice; but no man acquainted with the subject will plead such an excuse. Nor can he, in extenuation of his conduct, excuse himself on the ground that a similar practice is pursued by the legal profession of this country. Such a course is indispensable, on account of the references which are obliged to be made to the decisions of American cases, and which always greatly enhance the value of the reprint. Indeed, so true is this that, as I am informed by intelligent lawyers, no English treatise on law, without such additions, would meet with any circulation in its new home.

The practice here spoken of, so humiliating to our national pride, and so opposed to every feeling of patriotism, has never met with any encouragement in Great Britain. The only American works of any note that have ever been republished in that country, are Dorsey's *Surgery*, Beck's *Medical Jurisprudence*, Ray's *Treatise on Insanity*, and Warren's *Observations on Tumors*. If there were a strict, or even a moderate share of reciprocity on the subject between the two nations, much of the objection that now lies against the practice would cease; but English pride, English prejudice, and English patriotism would shrink from such an act. The practice, therefore, being one-sided, is disreputable, and should be discountenanced by all fair and honorable means.

We now and then hear of physicians who think that authors who are medical teachers should not be permitted to recommend their works as text-books to their pupils, on the ground, as they allege, that the practice is a serious evil, tending to trammel the student in his choice of books, and thereby promoting the publication and circulation of productions of inferior merit. It is difficult to discover the force of such an objection, the direct effect of which is to disparage native authorship, to repress native enterprise, to mortify native pride, ambition, and patriotism. If the works of American authors are so indifferent, so worthless, or so utterly bad as not to be used as text-books in American schools, then I maintain that they ought not to be read and countenanced by American physicians. If they are good enough for the latter, they ought assuredly to be

good enough for the former. Is this the estimate that should be placed upon the works of Chapman, Dewees, Eberle, Horner, Wood, Meigs, Miller, Dunglison, Pancoast, Condie, Bell, Drake, Dickson, La Roche, and a host of others equally able and useful? Have not their merits been acknowledged everywhere, in Europe as well as in America? Who among us will rise up, and attempt to reverse the verdict that has been pronounced upon them by the profession, or undo what has been hallowed by the genius of medicine? In Germany the custom has long prevailed among teachers of medicine to prepare works expressly as text-books for their pupils; and there is no school in that country, from the most humble to the most exalted, in which the custom has not been attended with salutary effects. If, as a general rule, professors are not qualified to write text-books, who are? They certainly, better than any other class of men, ought to be able to appreciate and supply the wants of their pupils. If they are not qualified to write, how can they be qualified to teach?

3. I proceed, in the third place, to notice the influence which is exerted upon American medical literature by the American medical press. That this influence is not imaginary, but real and positive, admits, I think, of easy demonstration.

The number of medical journals now in existence among us cannot be short of forty, comprising every grade from the weekly to the monthly, the bi-monthly, and the quarterly. These periodicals are issued in various sections of the Union, so that few even of the younger States are without a representative. It may be stated, in general terms, that they are edited with taste and ability, and that their pages afford evidence of research, erudition, and usefulness. Their original communications are, for the most part, of a practical nature, comparing favorably, in this and many other respects, with similar articles in the medical journals of other countries. But it cannot be denied that, in the department of criticism, they are generally deficient in boldness, force, and judgment, falling far below the common standard in the same branch of literature in Great Britain. The reviews are, with few exceptions, written without taste and without point, as if their authors were afraid lest they should be accused of unkindness, harshness, or ill-nature. They are characterized more by politeness than by a manly and independent tone, which is not afraid to utter its real sentiments and to affix the seal of its unbiassed judgment. They are marked by none of the masculine vigor which is so well calculated to impart

zest to the reader, and cause him to regret that he is so near the end of his task; which infuses life and spirit into a journal, and makes it a welcome guest at the table of the physician; which fashions and directs the dart, but blunts its point before it is permitted to strike its victim; which metes out equal justice to all men who come within its vitalizing, soul-stirring influence; which blends mercy with severity; which, when occasion requires, wounds but does not kill. It is a criticism which is neither alkaline nor acid, nor yet wholly neutral, but so nearly neutral as to render it impossible to determine its real character. It is a jesting, good-natured criticism, which, for fear of doing mischief, or of being thought unkind, is bound in swaddling clothes, lest, by its sudden and inadvertent jerks, it should kick over the milk and water in the inkstand of the happy, self-complacent reviewer. In fine, it is an inert, a tame, a spiritless criticism; a criticism without body, without strength, without soul, deaf and dumb, and blind and halt.

What the criticism of the medical press of the country should be must be apparent to every enlightened, right-thinking physician. It has an important mission to perform. It should be free and independent of all extraneous influence, foreign and domestic. It should exercise its functions openly, boldly, vigorously; with an eye single to the honor of the profession and the glory of America. While it should ever be ready to rebuke egotism, presumption, and ignorance, however exhibited, or from whatever source emanating, it should also be ready to speak the word of gentleness and kindness to the brother who adds his feeble mite to the general stock of knowledge and experience. While it does not cover, as with a mantle, his sins of omission and commission, it should endeavor to point out his defects in the spirit of affection and encouragement. It should hail his efforts as a good omen, as an evidence of his zeal and devotion to the cause of science, as a desire to render himself useful, and not to bury his talent in the earth, and lead the life of a drone. It should encourage him to proceed, to renew his efforts, to try again. It should not aim to extinguish him by the discharge of its gall, by harsh rebuke, insolent assertion, or, worse than all, by faint praise, which has so often blasted the aspirations of genius, and damped the energies of mediocrity. Nor should it indulge in undue severity against the works of our European brethren, but extend to them a cordial, a hearty, a threefold welcome. It should, in the discharge of its noble mission, institute a thorough examination into their merits, and award them

praise or censure, according to the dictates of its honest convictions. It should truckle to no man, clique, or faction; it should be subservient to no interests, save those of truth and justice. It should be patriotic, and at the same time cosmopolitan; local, and at the same time universal; for time, and at the same time for eternity. Like the judge upon the bench, it should, in all doubtful cases, lean to the side of mercy, and never condemn without adequate testimony. It should be blind, yet far-sighted; mild, yet stern and uncompromising, watching, as with an eagle's eye, the honor, dignity, and interests of American medicine. Such, I conceive, is the criticism which should animate and characterize the medical press of the country. Any other than this is illiberal, and unworthy of its high mission.

I have said that the American medical press lacks independence; and I may now add that this spirit, or, more properly speaking, this want of spirit, is nowhere more strikingly exhibited than in its reviews and notices of European reprints. That I may not make a charge, especially one of so grave a character as this, without reason, let me appeal to facts to verify and sustain my assertion.

It is notorious that American publishers of foreign works are in the habit of sending copies of every book, as soon as issued, to the editors of our medical journals, with a view to an early notice. The object of this notice, of course, is, not to disparage but to praise the book, in order that it may thus find its way rapidly to the profession. It is intended, indeed, by the publisher as an advertisement, to proclaim the peculiar fitness of the new candidate for public patronage. For this purpose the book is sent as a gratuity, and it is so regarded by the recipient. Thus, almost without his consciousness, he incurs an obligation, which he can only repay, not in kind but in form; that is, by a laudatory notice or review. If he fail to do this, he necessarily gives offence to the publisher, if he do not actually make him his enemy. That this is a natural consequence of this kind of intercourse between journalists and booksellers must, I think, be admitted by every one who has bestowed any reflection upon the subject. How can a man be so ungracious as to disparage the present of his friend or even of a stranger? Will not his sense of politeness prompt him to speak kindly of it, even if it be comparatively unacceptable, unimportant, or worthless? Does not the very fact that the book is a present frequently disarm just criticism?

But is editorial courtesy the only consideration which enters

into the merits of this question? Has self-interest no part in it? Does not the journalist derive direct "aid and comfort" from this source? Does not every book thus received add one more volume to his library? If an editor were charged with venality, or even with unconscious subserviency to the publishers of foreign reprints, he would repel the assault, and no doubt very justly, as false and slanderous. And yet editors do not differ from other men. Self-interest governs, to a greater or less extent, the whole human race. A journalist may make it a practice to speak favorably of every book that is presented to him, without any reference to pecuniary benefit, or without meaning or intending any harm to any one. He acquires a sort of habit, which, once established, his good nature induces him to continue; and thus he may go on, year after year, utterly unconscious of the injury which he is inflicting upon the profession and the progress of sound medical literature.

Another editor, perhaps less kind, but more independent, and more considerate for the advancement of his profession, pursues a different course. He, too, receives presents of books, but, governed by opposite motives, he does not hesitate to estimate them at their true value, and to publish to the world the convictions of his judgment. He commends their merits, while he fearlessly denounces their faults and their shortcomings. But if he had indulged any hopes of filling his library with books thus obtained, he is sadly disappointed. He is at issue with their very source and fountain. He has offended the publisher, and he must be prepared to suffer the consequences. No more books arrive; he thinks it strange, but time only serves to convince him that he has committed a *faux-pas*. The supply is cut off, and henceforth he is compelled to rely upon other sources for his bibliothecal treasures. That this statement is not exaggerated is a fact familiar to every American journalist himself. A few years ago a certain firm in Philadelphia, who had always been in the habit of sending copies of their reprints to the *Western Journal of Medicine and Surgery*, all of a sudden withdrew their favor, for no other reason, as was afterwards ascertained, than because the editor of that periodical had dared to speak disparagingly of one of their publications. Several instances of a similar character fell under my own observation during my brief connection with the medical press at Cincinnati. A case in point, but relating to another department of literature, and causing a great deal of notoriety at the time, occurred at Boston, last autumn. A political newspaper, the *Boston Traveller*, having published a severe

critique on Mr. Longfellow's *Song of Hiawatha*, the publishers, Messrs. Ticknor, Field & Co., immediately withdrew their advertising patronage, and ceased to send their publications. It is well known that the late Judge Story, the pride and glory of our judiciary, was the author of a work on Bills of Exchange, one of the ablest and most learned of his world-renowned productions. It might naturally be supposed that, inasmuch as he was the founder and chief ornament of the Law School at Cambridge, this work would be used, after his death, as it had been during his life, as a text-book in that institution. Far from it. The work employed for that object is that of Biles, an English treatise, republished by a Boston firm, one of whom happened to be a member of the board of trustees of Harvard University. These facts, which might be multiplied indefinitely, speak volumes; they show the influence which the publishers of reprints of foreign works exert upon the press of the country, miscellaneous and professional, and prove, in unmistakable terms, the truth of the statements set forth at the commencement of these remarks.

In making these comments, I beg leave to disclaim all intention of casting any censure either upon medical editors or on the republishers of foreign works. I have merely alluded to what I believe to be a habit into which some of the journalists of the country have fallen unconsciously in regard to the subject under discussion, and which they are unconsciously perpetuating. Nor, on the other hand, would I accuse the respectable body of republishers of any wrong intentions in their efforts to procure from the periodical press favorable notices of their productions. It is their business, as it is their interest, to promote the circulation of the works which they reprint. It is their pursuit; they live and grow fat by it. The American medical profession owes these republishers an immense debt, for affording them, in a cheap and accessible form, the works of our transatlantic brethren; as they owe us an immense debt for purchasing these works, and promoting their circulation, by the influence which we wield through the press, in the lecture-room, and in our private intercourse with each other. Thus far, the obligation is mutual. But here let it cease. Let our journalists procure these reprints at their own expense, and we predict that a healthier tone will soon become apparent in their critical notices and reviews.

4. I notice, in the fourth and last place, as a prominent cause of

the impediment under consideration, the little use that is made of the advantages afforded by private and hospital practice.

Every physician, however slender his talents or limited his opportunities, has it in his power to make himself useful to his profession. It is only necessary that he should carefully observe and faithfully record the facts that pass daily, for fifteen, twenty, or twenty-five years, under his eye to enable him to become a most valuable contributor to medical science and medical literature. If this habit were universal, the profession, and mankind at large, would not now have to lament the many imperfections and the many incongruities of the healing art. Many diseases which now baffle the skill of the physician and attest his impotence, would be rendered amenable to his remedies, and cease to be regarded as opprobrious. And what is true of individual observation and experience, is still more true of combined observation and experience, those compound pulleys and levers of the human mind. Our country is rich in medical charities, hospitals, almshouses, infirmaries, and asylums of all kinds. In the larger cities of the Union, institutions of this description exist that would reflect credit upon the intelligence and philanthropy of any nation in the world. They are, in fact, the palaces of the poor of our country. It is impossible, from the want of statistics, to form an accurate estimate of the number of sick and wounded that annually enjoy the benefits of these eleemosynary establishments. It cannot, at a rough calculation, be short of 120,000. The physicians, surgeons, and accoucheurs who have charge of them must amount to several hundred, embracing a large share of the best medical talent and intelligence of the country; and yet what have these institutions done, what have these physicians, surgeons, and accoucheurs done for American medical science, American medical art, and American medical literature? Where are the trophies which they have brought from this great battle-field of disease and accident? Where are the legacies which they have bequeathed, or which they are ready to bequeath, to their profession and their country? Can any one point to one solitary work, of any note or respectability, that has emanated from their pen, as the legitimate result and effect of the immense opportunities which they have thus enjoyed? Where are the treatises which they have furnished us on clinical medicine, clinical surgery, and clinical obstetrics; on fevers, on eruptive diseases, and on diseases of the digestive organs, the lungs, the heart, and the brain; on wounds, fractures, dislocations, injuries of the skull, tumors,

aneurism, amputations, resections, and various other important subjects? Where are their works on pathological anatomy and animal chemistry? Echo, alas! echo, alas! answers, where, where! We have accomplished, literally and absolutely, nothing in any of these particulars. Need we be surprised, then, when a recent English writer[1] exclaims: "We may safely say there is no American school of medicine; whereas there is a French, a German, an Italian, and an English. Our transatlantic offspring reprint, translate, and pirate the medical works of other nations, but they produce little of their own. Their pathology is chiefly French; their therapeutics English." Mortifying as such an accusation is, it is certainly not wholly destitute of truth.

Some of the hospitals of our country have been in successful operation for upwards of a century, and yet, during all this time, they have literally been as sealed books to the bulk of the profession. The only light that has ever emanated from any of them has been an occasional ray, apparently grudgingly bestowed, in the form of a contribution to some medical journal, more transient, perhaps, than the journal itself. We might, if it might not seem personal, point to some of these establishments where materials for the study of pathological anatomy abound that even a Rokitansky might envy; to some, where vast opportunities are constantly afforded for the study of all kinds of injuries, as wounds, fractures, and dislocations; to some, where syphilis might be investigated, in all its forms and phases, with the same facility and amplitude as at the Hôpital du Midi in Paris; to some, where there are annually upwards of seven hundred cases of parturition, and any amount and variety of diseases of women and children; to some, where pulmonary, gastric, and intestinal affections are of constant occurrence; and, finally, to some, where eye and ear diseases are studied and treated as specialties.

Of the 120,000 patients who, we have supposed, are annually admitted into the various hospitals, asylums, and other charitable institutions of the country, at least ten thousand die. The bodies of many of these are doubtless examined, but where are the records of the results? I am not aware that one solitary great and important paper on pathological anatomy has ever appeared in our medical journals from the pen of a hospital physician, surgeon, or accoucheur.

[1] Ranking's Half-Yearly Abstract, No. 22, p. 305, 1855. Philada., 1856.

The preceding facts require no comment; they speak for themselves. The patriotic physician, patriotic in a double sense, patriotic to his profession and to his country, may well exclaim, as he contemplates these things, "Watchman, what of the night?" When will official station and opportunities be turned to account? When will the light of medical science be made to emanate from these institutions, and to shed its quickening and exhilarating influence abroad upon the medical profession and the world? Had the opportunities above alluded to been properly employed, how rich might our profession now be in great works on pathological anatomy, medicine, surgery, and obstetrics! What light might we not now send by every steamer to Europe in liquidation of our literary debt! Our foreign bonds would soon be cancelled, and American repudiation would cease to be a byword among our transatlantic brethren.

Having thus pointed out, as briefly as was consistent with the nature of the importance of the subject, the principal causes which obstruct the progress of American medical literature, let me conclude by offering a few remarks respecting the best means for removing them.

Our course in relation to this subject is sufficiently obvious. Our duty, indeed, is self-evident. It is comprised in one solitary principle, namely, justice to ourselves, justice to our profession, justice to our country. If we discharge this duty faithfully and vigorously, as it becomes us as men, as physicians, as patriots, and as Christians, we shall be no longer subjected to the taunts and reproaches of the transatlantic press, when it asserts, in the very face of the constant and liberal use which it makes of our labors, that America has no medical school, no pathology, and no therapeutics, save what she borrows from France and England. We have simply to throw off the yoke which has so long galled and oppressed us; to declare ourselves, as far as our schools are concerned, free and independent of the literature of Europe, from whatever quarter emanating; to encourage and foster our own authors; and, finally, to make the best possible use of the means, private and public, which are at our disposal for the establishment of an original, a vigorous, and an independent national medical literature. In a word, it is only necessary that we should reclaim our heritage, which, Esau-like, we have well nigh sold for a mess of pottage to our European brethren; to beat down Satan under our feet; and to assert the rights, privileges

and immunities which have been vouchsafed to us, to our profession, and to our country, by an all-wise and beneficent God.

In view of the speedy and successful accomplishment of these desirable ends, I beg leave to submit the following resolutions:—

Resolved, That this Association earnestly and respectfully recommend, first, the universal adoption, whenever practicable, by our schools, of American works as text-books for their pupils; secondly, the discontinuance of the practice of editing foreign writings; thirdly, a more independent course of the medical periodical press towards foreign productions, and a more liberal one towards American; and, fourthly, a better and more efficient employment of the facts which are continually furnished by our public institutions for the elucidation of the nature of diseases and accidents, and, indirectly, for the formation of an original, a vigorous, and an independent national medical literature.

Resolved, That we venerate the writings of the great medical men, past and present, of our country, and that we consider them as an important element of our professional and national glory.

Resolved, That we shall always hail with pleasure any useful or valuable works emanating from the English press, and that we shall always extend to them a cordial welcome as books of reference, to acquaint us with the progress of legitimate medicine abroad, and to enlighten us in regard to any new facts of which they may be the repositories.

S. D. GROSS.

Louisville, May 6, 1856.

REPORT

OF THE

COMMITTEE ON MEDICAL LITERATURE.

REPORT OF THE COMMITTEE ON MEDICAL LITERATURE.

THE undersigned, appointed by the American Medical Association at its seventh annual meeting to report on the state and prospects of American Medical Literature, in fulfilling that duty beg leave to say, that in the execution of their design they have had to contend with considerable difficulties.

Not having had access to anything like complete files of the various journals of the country, nor having had submitted to their inspection very many of the medical treatises published during their committee-life, they can of necessity present only an imperfect *resumé* of the actual issues from the press—while the general considerations touching the various branches of this important subject have been so ably handled by previous committees, that there seems but little left for present discussion. So thoroughly, indeed, has the harvest been garnered, that the gleaners last sent into the field, scarcely dare hope to gather more than a few scattering sheaves.

From the earliest organization of this body, few subjects have engaged its more earnest attention than American Medical Literature. The first meeting of a National Medical Congress, as a permanently organized body, was presented with a very able paper on this subject, and in the transactions of nearly every successive one are found elaborate reports relative to the same topic. Such an interest is natural, and such action is wise. Every man must feel that the usefulness at home, scarcely less than the honor abroad, of our medical men is deeply concerned in the successful accomplishment of the purpose originally contemplated in all this movement —the fostering, strengthening, and, as near as may be, perfecting our medical literature. Such an object is dear to our hearts, because its fulfilment implies, not only the existence, but the further deve-

lopment of those mental powers, acquirements and graces, as well as the increased facilities for their attainment, upon which this result must depend.

Owing to the fact before alluded to, viz: the incompleteness of the files of the medical periodicals, which it has been in the power of your committee to obtain, they do not feel willing to attempt the discharge of that part of their duty, which should embrace an examination of these publications, "in reference to the more important articles therein presented to the profession." They design noticing very briefly, such "original American medical publications, and American reprints of foreign works," as have fallen under their observation, and discussing the general condition and prospects of our medical literature.

The original American works which have issued from the medical press during the last year are numerous, and some of them of permanent interest and value.

Those which have come under the observation of your Committee are the following:—

A Systematic Treatise, Historical, Etiological and Practical, on the Principal Diseases of the Interior Valley of North America, as they appear in the Caucasian, African, Indian, and Esquimaux Varieties of its Population. By DANIEL DRAKE, M. D., Vol. II.

Five years ago, in a notice by the Chairman of the Committee on Medical Literature, the 1st volume with this title was pronounced one of the great works of the day—an enduring monument of fame. The general professional verdict at home has indorsed the sentiment, while some of the ablest and most candid critics abroad have reiterated it. It is greatly to be regretted that the author did not live to complete and perfect his work. No editors, however able, can supply the place of an author under such circumstances; hence, in spite of the fidelity, industry, and well-known ability of the editors,[1] there are, in some parts of the volume, deficiencies and other evidences of incompleteness, that would not else have existed.

A treatise, the result of thirty years' investigation and labor by an acute and philosophic observer, cannot fail to command attention —and, however much men may differ as to the value of such works compared to the more compact and practical ones on the same general subject already in existence, or however much they may

[1] Prof. S. HANBURY SMITH, M. D., and Prof. FRANCIS G. SMITH, M. D.

disagree with some of the author's views on pathology and therapeutics, *this* will always be referred to, as containing a mass of facts and opinions, gathered with care from all parts of our broad confederacy, not elsewhere on record. It will do honor to the memory of one who, during life, bore the character of a close reasoner, a profound thinker, an eloquent teacher, and a laborious cultivator of the great field of science.

On the Nature, Signs, and Treatment of Childbed Fevers, in a series of Letters addressed to the Students of his Class. By CHAS. D. MEIGS, M. D.

The accomplished author of these letters is so well known to the profession as an erudite scholar, a popular and successful teacher, and an able though somewhat eccentric writer, that his treatises are always sought after with avidity. His writings are extensively read, and they merit it. His professional standing is high, and deservedly so. However much his style may be carped at—and, as a model, it certainly is amenable to a somewhat sharp criticism—no one denies to him singular ability and great research. We cannot but think, however, that a large majority of the more intelligent and well-informed members of the profession will differ widely with him on the main views advanced in this volume.

The doctrine that "Childbed" fever is always purely an inflammatory fever, the proposition that it is never portable, and the propriety of employing the lancet in every form and variety of the disease, as the main curative agent, are dogmas, for the reception of which, we are sure the professional mind, in this country at least, is not yet prepared.

A Practical Treatise on Foreign Bodies in the Air-Passages. By S. D. GROSS, M. D., Prof. Surg. University of Louisville.

This is an octavo of nearly five hundred pages, the materials of which, as we learn from the preface, have been derived partly from personal observation, partly from the experience of professional friends, but mainly from the various medical journals of the United States, Great Britain, and the Continent of Europe. The work contains a minute account of about fifty cases that have never before been published. It is, we believe, the first elaborate monograph on the subject of which it treats that has ever appeared. It bears upon its face marks of the well-known industry of its author, and

its want of condensation is amply atoned for by the fulness and interest of its details.

Pneumonia: Its supposed connection, Pathological and Etiological, with Autumnal Fevers; including an Inquiry into the Existence and morbid Influence of Malaria. By R. La Roche, M. D.

The main object which the author of this elegant treatise had in view, was to prove that the idea of the identity of pneumonia and autumnal fever "is founded on insufficient data, and is in fact little more than a dream of the imagination."

In this, as in his previous writings, he has shown himself a patient and cautious observer, an erudite student, and a man of refined and cultivated taste.

One of the most readable volumes issued from the press during the past year, is the *Autobiography of* Charles Caldwell, M.D., with a preface, notes, and appendix, by Harriot W. Warner.

The history of the life and experience of such a man, so recorded, cannot fail to interest every one. This venerable octogenarian, dying, has left behind him a name which will not soon be forgotten. A life of eighty years was to him a life of continued conflicts, and almost uninterrupted triumphs. Struggling with poverty for an education, he soon became a finished scholar. For more than half a century he maintained a reputation not often accorded to men by their contemporaries, for profound and varied learning, for elevated and noble thoughts, and a sincere and earnest search for truth. His mind, essentially reflecting and philosophical, led him as to some points, far ahead of his generation; while a fearless zeal seemed to make him seek rather than shun controversy. And if in later life he clung with unreasonable tenacity to opinions formed long ago, it was because able and prominent men so decidedly expressed, and so long continued an opposition to views, the truth of which, to his perceptions, was as clear as the beams of the noonday sun.

The writings of this eminent man are very voluminous, sufficient of themselves almost to make a small library. The mere list of such as have been published occupies several pages in the Autobiography, embracing "thoughts" on nearly every variety of subject, that the pen of a most industrious scholar could trace.

Upon one other point let us do justice to the memory of the dead. To him rightfully belongs the honor of suggesting the idea

and proposing the plan, whoever may have been first successfully to put it in operation, of a National Medical Congress. Twenty-four years ago, in one of those great orations, he knew so well how to make, he said: "The physicians of the United States have it in their power to form a most magnificent and useful institution in medicine the world has witnessed. It may be made to embrace the whole Union, and to confer on the profession, and on mankind, incalculable benefits. Nor is there any difficulty in the enterprise, provided it be attempted with unanimity, vigor, and resolution, and under the lights that may be easily brought to bear on it. It consists in the formation of a Medical Society in each State, under the authority of a law of the State, and composed of all the educated and respectable physicians that reside within its limits. * * * Let these Societies be connected by a Diet, or Amphictyonic council, composed of a deputation of members from each, to meet as often as may be deemed requisite, and superintend the interests of the whole. * * * Under a wise arrangement and a skilful and vigorous execution, a blaze of medical light would ultimately issue from them, such as time has never witnessed. This light would arise from various sources, and be diffused in various ways. American medical literature, in general, would be greatly promoted by the arrangement proposed. Am I asked, in what way? I answer, that by their frequent meetings, the Societies would render both reading and writing more fashionable, than they are at present. From certain well known principles which govern human actions, as well as from the result of all experience, in such cases, this effect could not fail to be produced. American periodicals in medicine would circulate much more extensively, and be better supplied with original and useful matter. * * * One part of the duty of the Diet, or General Council of the Societies would be, to propose Prize Questions, on suitable subjects: such a measure would be necessarily productive of many valuable essays. * * * In fine, by thus federalizing a scheme for the promotion of medicine in the United States, the medical statistics of our country might be developed to an unprecedented extent, and the profession placed on an eminence it has never before attained."

Though these last tracings of his pen hardly bear the full impress of his bold and vigorous mind, they will be much read. Their discursiveness will be liked for the interest of the digressions; their egotism pardoned for its harmlessness, and its *thoroughness;* their

occasional bitterness forgiven, for his impression of the greatness of his wrongs.

The Transactions of the American Medical Association, Vol. VII.

Notes of M. Bernard's Lectures on the Blood. By WALTER L. ATLEE, M. D., is the title of an interesting duodecimo of 224 pages, recently issued.

A Dictionary of Medical Semeiology, Dental Surgery, and the Collateral Sciences. By CHAPIN A. HARRIS, M. D.

Nature in Disease. By JACOB BIGELOW, M. D.

Human Physiology. Designed for colleges and the higher classes in schools, and for general reading. By WORTHINGTON HOOKER, M. D.

Principles of Physiology. (For similar purposes.) By J. C. CONSTOCK, M. D., and B. N. CORNINGS, M. D.

Two elementary treatises which are calculated to answer as well (that of Dr. Hooker much better), the purposes for which they were written as any others we have seen. We cannot express a very high opinion of the real value of treatises of this kind, yet it is greatly to be desired that some such work as Dr. Hooker's should replace the silly trash with which the juvenile mind was regaled, no long years ago.

The Anatomy, Physiology, and Pathology of the Human Teeth; with the most approved Methods of Treatment, including Operations, and the method of making and setting Artificial Teeth. By PAUL B. GODDARD, M. D., &c., aided in the practical part, by JOSEPH E. PARKER, Dentist.

Positive Remedial Agents; being a Treatise on the Non-Alkaloid, Resinoid, and Concentrated Preparations of Indigenous and Foreign Medical Plants. By the Authority of the American Chemical Institute.

Diseases and Injuries of Seamen, &c. By G. R. B. HORNER, M. D., Surg. U. S. N.

On the Construction, Organization, and general Arrangement of Hospitals for the Insane. By THOS. S. KIRKBRIDE, M. D., Physician to Pennsylvania State Asylum for the Insane.

Reports from the Lunatic Asylums of Maine, Vermont, Massachusetts, Rhode Island, Pennsylvania, New York, New Jersey, Maryland (Mt. Hope), Missouri, Indiana, and Michigan.

An Examination of the Practice of Bloodletting in Mental Disorders. By PLINY EARLE, M. D. A volume of 146 pages devoted to the discussion of the following question, viz: *To what extent, in regard to both frequency and quantity, is the abstract of blood required in the treatment of Insanity?* The final answer to this question is summed up in the following conclusions:—

1. Insanity, in any form, is not, of itself, an indication for bloodletting.

2. On the contrary, its existence is, of itself, a contra-indication. Hence, the person who is insane should, other things being equal, be bled less than one who is not insane.

3. The *usual* condition of the brain, in mania, is not that of active inflammation, but of a species of excitement, irritability, or irritation, perhaps more frequently resulting from or accompanied by anæmia, debility, or abnormal preponderance of the nervous over the circulatory functions, than in connection with plethora and enduring vital power.

4. The excitement, both mental and physical, produced by this irritation, can, in most cases, be permanently subdued, and its radical source removed by other means, more readily than by bleeding.

5. Yet insanity may be coexistent with conditions—such as positive plethora, a tendency to apoplexy or paralysis, and sometimes sthenic congestion or inflammation, which call for the abstraction of blood. Therefore,

6. Venesection in mental disorders should not be absolutely abandoned, although the cases requiring it are very rare.

7. As a general rule, *topical*, is preferable to *general* bleeding.

8. In many cases where the indication for direct depletion is not urgent, but where bloodletting, particularly if local, might be practised without injury, it is safer and better to treat by other means, equalizing the circulation and promoting the secretions and excretions.

9. The physical conditions requiring bloodletting more frequently exist in mania than in any other of the ordinary forms of mental alienation.

10. Insanity following parturition, other things being equal, is to be treated by bleeding less frequently than that which has its origin in other causes.

11. If the mental disorder be the direct result of injury to the head, the treatment must be directed to the wound, or its physical effects, not specially to the psychic condition.

12. In many cases where insanity is accompanied by typhous symptoms, and in some where the aspect is that of acute phrenitis, active stimulants alone can save the patient, and direct depletion from the circulation is almost certainly fatal.[1]

Report of the Select Committee of the Senate of the United States, on the Sickness and Mortality on board Emigrant Ships. HAMILTON FISH, Chairman.

A fitting close to this doubtless imperfect catalogue will be found in the bare announcement, for more would be superfluous, of the appearance of new editions of

Woman: her Diseases and Remedies. By CHARLES D. MEIGS, M. D., *2d edition;*

A Treatise on the Practice of Medicine. By GEO. B. WOOD, M. D., *4th edition*, and

The Dispensatory of the United States of America. By Profs. WOOD and BACHE, *10th edition.*

The rapidity with which edition after edition of these works is disposed of, is sufficient evidence of the popularity which they enjoy, and, let us add, merit.

The Dispensatory is better known, and more widely distributed, probably, than any other treatise which has ever been published in the country; and your Committee cannot allow the opportunity to pass without expressing their high sense of the value of this admirable book.

Besides these, are many smaller and less pretending treatises, in pamphlet form, consisting mainly of republications of articles which had already appeared in some of the journals. Some of them are worthy of notice.

One of them is entitled: *Puerperal Fever as a Private Pestilence*, by OLIVER WENDELL HOLMES, M. D., Professor of Anatomy and Physiology in Harvard University. Originally published some twelve years ago, this timely contribution to medical literature and scientific truth, has been again put before the profession, without alteration in itself, but with a full "Introduction," and a brief but comprehensive appendix. The aim of this paper is to establish clearly the point that puerperal fever may be, and, occasionally at least, is carried from patient to patient, by medical assistants. If

[1] New York Journal of Medicine.

this proposition be not satisfactorily proved to every man who reads this little book with an unprepossessed mind, there is an end, to such an one, of all proofs on questions of contagion. So clear and concise is the argument, so pointed are the facts adduced, so direct and weighty are the authorities cited, that a conviction of the soundness of the view presented seems unavoidable. At any rate, even if such conviction fail, there cannot be the shadow of a doubt as to the propriety of the precautionary measures recommended.

Another pamphlet-monograph, recently appearing, is a republication, from the *Western Journal of Medicine and Surgery*, of three lectures, by HENRY MILLER, M. D., Professor of Obstetric Medicine in the University of Louisville, designed as a reply to the "Croonian Lectures," by Dr. West, of London, on the pathological relations of inflammation and ulceration of the cervix uteri. Dr. West and Dr. Miller represent, respectively, the views of two large and very respectable classes of practitioners; the former teaching substantially that inflammation of the neck of the uterus, to any great extent at least, is *not* common: is not ordinarily the cause of serious constitutional disturbance, and does not often require local remedial applications; while the latter maintains that such morbid action is common; is not unfrequently the cause of grave symptoms, general and local; and may be cured only, in most cases, by direct applications; the question of the propriety of the common employment of the speculum being largely involved in the issue. Without expressing any opinion upon the merits of the subject, we must award Dr. Miller the praise of having made a reference of his views, which, if not absolutely convincing, is yet masterly and striking.

Dr. WM. M. BOLING, of Alabama, has published an elaborate essay on the *Mechanism and Management of Shoulder Presentations*, which is creditable to him as an observer and a writer. Giving a fair *resumé* of what is taught by standard authors, and preferring the term *spontaneous evolution*, as taught by Denman, to that of *spontaneous expulsion* adopted by most writers since Douglass's explanation of the mechanism of the process, he asserts that neither of those heretofore given is correct, and attempts to show that rotation so alters the position of the fœtus that the incurvation is towards the anterior, instead of the lateral portion of the child's body. His remarks on the use of bloodletting, opium, and especially chloroform, are eminently judicious.

Difficult Labors and their Treatment. By Prof. M. B. WRIGHT. A prize essay, reprinted from the *Proceedings of the Ohio State Medical Society.*

Cases of Polypus of the Womb, is the title of an interesting pamphlet by Dr. CHANNING, of Boston, containing, besides the history of thirteen cases, some remarks in reference to the non-malignancy of these tumors, and their failure ever to reappear in the same spot from which they have been removed.

Pathology and Treatment of Infantile Laryngo-Tracheitis, or Croup. By E. R. PEASLEE, M. D.

Remarks on Croup, and its Treatment. By HORACE GREEN, M. D.

Exsection of the Head of the Femur, and Removal of the Upper Rim of the Acetabulum, for Morbus Coxarius. By LEWIS SAYRE, M. D. An exceedingly interesting case, well recorded. Accompanying is a table, containing a brief abstract of thirty operations of this formidable character by different surgeons, the result of which is thus summed up: "Recovered, 20: of these 13 were completely successful; 3 died of an intercurrent disease, at periods varying from three months to years after the operation; 1 is reported as not having progressed favorably. The remainder were too meagrely reported, or too recently performed to decide correctly of the results. Died, 10: of these, 4 died within one week after the operation; 1 on the twelfth day; 2 in two months; 1 some months after; 1 unsuccessful.

Poisoned Wounds—Their distinctive features, classification, and a treatise on the nature and treatment of wounds resulting from the bites of venomous reptiles, experiments, being a report to the Medical Association of Missouri. By A. F. JETER., M. D., Chairman Com.

Essay on a new Method of treating Serpent Bite, and other Poisoned Wounds. By DANIEL BRAINARD, M. D., Prof. of Surg. in the Medical College of Chicago.

A new Plan for treating Ununited Fractures, by HENRY H. SMITH, M. D., is another ingenious attempt to solve a difficult problem.

Ethoplasty, or Old Ulcers treated by Anaplasty. By F. H. HAMILTON, M. D., Prof. of Surg., Buffalo.

Discovery of the Cause, Nature, Cure, and Prevention of Epidemic Cholera. By W. L. KNAPP, late Prof. in University of Iowa, and Rush Medical College, &c. &c.

This paper is an argument to prove the necessity of the presence of a *scorbutic diathesis*, before a person can be attacked with cholera.

"It has," says the author, "been a hard and difficult task to divest my mind of the false notion of some specific poisonous influence *overlaying scurvy*, even since I have been fully aware of the scorbutic diathesis underlaying cholera. It may be difficult for others even yet to see clearly; but if, as appears by our analysis, every case of cholera is a messenger of death riding *always* on the time-honored steed Scorbutus, it matters but little what be the theory as to the office or entity of the messenger; if we destroy the steed, the rider will get on but poorly. This we know how to do. But I can see no occasion now to search for the further cause of cholera, than the causes producing scurvy, no phenomena in cholera other than what harmonize with the well-known laws of scurvy, and nothing at the bedside after hemorrhagic action is arrested, but the physical evidences of scurvy. Neither do the books describe any anatomical lesions contradictory to this view." The article is a striking exhibition of the completeness with which riotous theory may displace sober judgment.

Congestion of the Brain in Cholera. By JAS. NEWMAN, M. D.

Observations on Asiatic Cholera as it appeared in Cincinnati, 1849–50. By THOMAS CARROLL, M. D.

Simaba Cedron.—Under this title are republished in phamphlet form from the *New York Journal of Medicine*, some theoretical and practical views, by Dr. PURPLE, in regard to the fruit of this tree. The conclusions are, that it possesses decidedly antiperiodic properties, that it is less likely than quinine to produce encephalic or neuropathic phenomena; that in periodic and yellow fever it is not far inferior to quinine; that it possesses notable tonic properties, and that it may be obtained at a much smaller cost than quinine.

Another form of periodical literature is found in the published *Transactions* of the various State and other Medical Societies. These are annually increasing in number and interest. Those which have fallen under the observation of your Committee are,

Ohio State Medical Society (9th annual meeting).

Illinois State Medical Society (4th annual meeting).

Medical Association of the State of Alabama (7th annual meeting).

Medical Society of the State of New York.

Medical Association of Southern Central New York (8th annual meeting).

Medical Society of the State of N. Carolina (5th annual meeting).

Iowa State Medical and Chirurgical Society (3d and 4th sessions).

Medical Society of the State of Pennsylvania (volume 4th).

College of Physicians of Philadelphia—Quarterly Summaries.

These are, in the main, creditable to the physicians concerned, as strictly professional records—some of them furnishing admirable essays and reports. If the members of these local societies would use their best efforts—would make a concise but sufficiently full exhibit of the more important results of their observation—would discharge carefully the duties respectively assigned them, would regularly gather in numbers to exchange professional experience and friendly greetings, there could be no question that results for good would ensue, the greatness of which might surpass the expectations of even the most sanguine. This kind of associated effort—the association and the effort both made stronger by harmony of feeling—cannot fail to do good whenever and wherever it is tried. The influence of county, district, and State societies, even as at present existing, many of them lacking energy, and almost vitality, because so many of their members are careless and indifferent, careless of attendance, and indifferent because they do not see any immediate and happy results springing from their meetings—is yet powerful and beneficial. We trust the day is not far distant when this influence will be greater and more pervading, when every medical man will acknowledge it, and feel it his duty to contribute his share, no matter how small, to the permanence, efficiency, and value of these institutions.

SANITARY REPORTS exhibit still another phase of our medical literature. These are generally of great interest, containing facts and statistics of importance in relation to topography, hygiene and mortality, both from endemic and epidemic diseases, principally, however, from the latter. The only ones we have been able to examine are those of the cities of Buffalo, Memphis, and New Orleans; the first by JAMES M. NEWMAN, M. D., Health Officer; the second by Prof. CHAS. S. QUINTARD, and the third by a joint com-

nission composed of Drs. AXON, MCNEIL, RIDDELL, SIMONDS and BARTON. This commission was appointed by the Board of Health, 'through the urgent promptings of public sentiment," with special nstructions: 1st. To inquire into the origin and mode of transnission or propagation of the late epidemic fever (1853). 2d. To nquire into the subject of sewerage and common drains; their daptability to the situation of the city, and their influence on ealth. 3d. To inquire into the subject of quarantine; its uses and pplicability, and its influence in protecting the city from epidemic nd contagious maladies. 4th. To make a thorough examination into the sanitary condition of the city, into all the causes influencing it in present and previous years, and to suggest the requisite sanitary measures to remove or prevent them, and into the causes of yellow fever in ports and other localities having intercourse with New Orleans.

These questions were referred to different members of the commission. Drs. Axon and McNeil discuss ably the first, relative to the origin and spread of the pestilence, deducing as conclusions: 1st. That it was not derived from abroad, but is of spontaneous origin. 2d. That there existed very peculiar meteorological conditions known by general experience to be capable of producing, in co-operation with local causes, fatal and malignant forms of fever. 3d. That these conditions were present in a very exaggerated degree, and impressed upon the prevalent type of disease, susceptibilities and habits assimilating it to another and distinct form of fever; and 4th. That this showed in all those localities within the range of the meteorological state or influence, an infectiousness not necessary to, or characteristic of the fever, but purely casual and accidental, the result of physical causes, and which it loses as soon as these causes are changed or disappear.

The result of Prof. Riddell's investigation of the second, is a business like, practical, and yet scientific report on a general system of drainage and sewerage.

Dr. Simonds, to whom was committed the third inquiry, contributes a forcible and ingenious, though by no means satisfactory defence of quarantines.

The fourth, it will be seen, comprehended, or at least was supervisory, of all the others, and has drawn from Dr. Barton a most voluminous report, in which will be found many facts of great interest and some very striking views, though a number of well directed efforts at condensation, and a little more attention to the

choice of words, the localities of punctuation marks, and to the rules of grammar, would have somewhat improved the style of this paper. These faults are, however, redeemed by the great merits of the work in other respects.

The volume, which is one of no mean size (pp. 542, 8vo.), abounds in tables, maps and charts, and is evidently the result of great labor. It evinces an unusual industry and a zeal which are really refreshing and reflect credit upon the authors, especially Dr. Barton. We apprehend, however, that the conclusions of the Board will not command universal assent. Summarily they are two:—The one is that yellow fever is and always has been, here and elsewhere, a *preventable disease.* The other is, that the presence of two hygienic conditions is absolutely indispensable to the origination and transmission of the disease; the one of them *atmospheric;* the other, *terrene. These must meet in combination.* The term *terrene*, as defined by Dr. Barton, embraces "every species of noxious effluvia, which filth of every description, and disturbances of the original soil, generate and transmit."

We scarcely dare congratulate ourselves upon the certainty of these things, and fear that Dr. Barton's name will not descend to posterity crowned with the glory that must surely be the reward of him who shall discover the cause, and provide infallible means for the prevention of such a scourge as yellow fever.

REGISTRATION REPORTS.—None of these for the current year have fallen under the observation of your Committee.

Among the American reprints of foreign works, will be found a new edition of *The Principles and Practice of Obstetric Medicine and Surgery in reference to the Process of Human Parturition.* By FRANCIS A. RAMSBOTHAM. With notes and additions by WM. V. KEATING, M. D.

An elaborate and well-known work, of which it is scarcely necessary that your Committee should express a hearty commendation. Few men have had larger opportunities for observation, and few could use them to better purpose. This treatise is one of the best ever written on this branch of practical medicine, a branch, by the way, whose literature is rich and extensive.

We are pleased to notice it prefaced by a well deserved dedication to Prof. Chas. D. Meigs, and sorry that the author still holds

to his ultra views on the use of anæsthetics in natural labor; for surely those views must be considered ultra, that lead to such strong condemnation of the use of these agents at any time, and in any quantity in the "ordinary pains of child birth."

The Modern Treatment of Syphilitic Diseases. By LANGSTON PARKER, Surgeon to the Queen's Hospital, Birmingham. From the 3d London edition.

The author of this work has devoted nearly a quarter of a century to the therapeutics of syphilis, more especially its constitutional forms. His experience has been large. In addition to the cases which have fallen under his notice, as surgeon to an extensive hospital, he has treated in private practice more than eight thousand. Such experience ought to be worth something. On many of the knotty questions of syphilis he agrees with Vidal de Cassis and Erasmus Wilson, rather than Ricord. In his mode of treating the disease in its constitutional forms, he is somewhat peculiar. While mercury is the staple of his treatment, he rejects its administration by the mouth, or by inunction, and relies on it in the form of vapor, diluted and made moist by admixture with the vapor of water.

The Science and Art of Surgery, being a Treatise on Surgical Injuries, Diseases and Operations. By JNO. ERICHSEN, Prof. Surgery in University College. Edited by JOHN BRINTON, M. D.

It is in the republication of works like this that publishers confer a real benefit upon the profession. Plain, sensible, practical and judicious, it has already won the esteem of discriminating surgeons, as a trustworthy and reliable summary of the science and art of surgery. Nowhere in the language can be found, within the same compass, so complete and satisfactory an exposition of the leading principles and soundest practice of this branch of medicine.

The Microscopic Anatomy of the Human Body in Health and Disease, illustrated with numerous drawings in color. By ARTHUR HILL HASSALL, M. D., &c. &c. Edited, with additions, by HENRY VAN ARSDALE, M. D.

Manual of Human Microscopical Anatomy. By Prof. KÖLLIKER, of Wurzburg; an American edition of which has lately been repub-

lished, by Dr. J. DA COSTA, from the English translation of Bush and Huxley.

The Principal Forms of the Skeleton and the Teeth. By Prof. R. OWEN.

Principles of Comparative Physiology. By W. B. CARPENTER, M. D., F. R. S. (from fourth London edition).

The writings of Carpenter are among the most popular in the whole range of science. Not himself a profound investigator of the laws of life, he has a most graceful as well as a very satisfactory way of collating and systematizing the results of the labors of others, and it is hazarding little to say that this faculty, possessed to such an extent, will always, with the mass of men, secure for an author a wider renown than falls to the more laborious explorer of the labyrinths of nature.

Lectures on the Diseases of Infancy and Childhood. By CHAS. WEST, M. D., F. R. S. Second American, from second London edition.

An Inquiry into the Pathological Importance of Ulcerations of the Os Uteri (Croonian Lectures, for 1854). Same author.

The Pathology and Treatment of Pulmonary Tuberculosis. By JOHN HUGHES BENNETT, M. D., F. R. S. E., Prof. University Edinburgh. After pointing out clearly the pathology of the disease, the author proceeds to show: 1st. That tubercular diseases will heal of themselves if the faulty nutrition of the system can be removed. 2d. That with this object our efforts should be directed to the digestive rather than to the respiratory system. 3d. That the kind of abnormal nutrition which exists is dependent on increased assimilation of the albuminous, and diminished assimilation of the fatty portions of the food.

Clinical Lectures on Pulmonary Consumption. By THEOPHILUS THOMPSON, M. D., F. R. S., Physician to the Hospital for Consumption and Diseases of the Chest.

Auscultation and Percussion. By Dr. JOSEPH SKODA. Translated from the fourth edition by W. O. MARKHAM, Assistant Physician to St. Mary's Hospital.

Without assenting to the truth of the teachings of this distinguished diagnostician, or, indeed, expressing any opinion as to the

value of his system and the correctness of his explanations, we must admit that his "Theory of Consonance" is original and ingenious, and his work worthy of a serious and candid attention.

What to Observe at the Bedside, and after Death (2d American from enlarged 2d London edition), is the title of a small but comprehensive volume, "published under the authority of the London Medical Society of Observation," containing full suggestions on almost every point that concerns the physician in his examinations, therapeutic or cadaveric. If this same learned society, or some other, would only teach the juniors (and some of the seniors, too) *how* to observe, as well as *what* to observe, the gratitude of the human race would be theirs. To observe minutely is one thing, and a very good one; to observe intelligently and profitably, is another and a better.

A Treatise on Fracture in the Vicinity of the Joints, and on certain Forms of Accidental and Consequential Dislocations. By ROBERT W. SMITH, M. D.

A Manual of Pathological Anatomy. By C. HANFIELD JONES, M. B., F. R. S., and EDWARD H. SIEVEKING, M. D.

A complete summary, and an excellent compilation; and honestly acknowledged to be *only* a compilation. A piece of frankness which some good book-makers here and elsewhere would do well occasionally to imitate.

A Text-book of Practical Anatomy. By ROBERT HARRISON, M. D., M. R. I. A.

A Clinical Introduction to the Practice of Auscultation and other means of Physical Diagnosis in Diseases of the Lungs and Heart. By H. M. HUGHES, M. D, &c. 2d American from 4th London edition.

A Hand-book of Chemistry, Theoretical, Practical, and Technical. By F. A. ABEL and C. S. BLOXAM.

In a critical survey of our national medical literature, not only for the current year, but for years gone by, we have been strongly impressed by two antagonistic particulars respecting it: 1st, its general excellence; and 2d, the depreciation which it has so often met with at the hands of some of our own brethren. It will be found that scarcely a solitary reporter to your body on this subject, has failed to lament the low state and condition of our

professional literature, and to suggest explanations more or less satisfactory, of such condition, and means more or less profound of remedying it. At the last annual meeting of this Association, on motion of a distinguished gentleman, himself an author of no mean repute, a special committee was appointed to report on the causes which tend to "impede the formation of a national medical literature." For years past, some of our journals have teemed with articles, editorial and communicated, whose set purpose seems to be to depreciate to the last degree the extent of American medical scholarship, and the value and trustworthiness of American medical authority. From the dignified reporters of the Association to the silliest of anonymous scribblers, who bewail with grievous lamentations this national degradation; who declaim with fiercest invective against the pandering to foreign authors on the part of our medical readers; who, rising with patriotic spleen into the regions of sublimated eloquence, as when the veriest ass becomes

> "A Pegasus,
> A sun-reared charger snorting at the stars,
> And kicking all the Pleiads at his heels,"—

there are those who see nothing but a dishonorable lack of nationality in the fact that we do not discard foreign authors merely because they are foreign, and welcome with affectionate embraces native ones merely because they are native. They sorrowfully complain of the unworthy condition of our literature, and consequently of the general demerits of our authors. We cannot, upon a calm review of the whole subject, add our voices to this melancholy chorus. On the contrary, we look with just pride upon our national literature, even the medical part of it. It is true, indeed, that it scarcely represents the full professional merit of the country. It is likewise true that in it are exhibited many shallow thinkers, many careless observers, many loose compilers, many literary upstarts, many unworthy imitators, and some dishonorable plagiarists. But they know little of general or professional literature, who do not know that such characters are represented in every country, and every age, and who have not found, by personal experience, that he who seeks mental sustenance is apt to find more chaff than grain.

It is not to be denied that our medical men seldom indulge in the abstruse metaphysical speculations so characteristic of the German mind; that they do not exhibit the patient yet eager pathological research which marks the French; and, in all fairness, it must be

admitted that very many English works are superior to some American treatises upon the same general subjects. It is likewise true that, proportionally, fewer volumes, of a high philosophic or scientific cast, have appeared from native, than from foreign authors. All this may be acknowledged without the slightest sense of national, professional, or personal humiliation. Be it remembered that the literature of a people is connected not only with its talents, acquirements, and character, but with its stage of development and its state of existence. The present is, with us, emphatically an age of action, not of repose—of restlessness, not of quiet—of growth, not of maturity. The existence of the scholar is separate and apart from that of the man of the world. Continually engaged in the great battle of life, every interest of the latter is absorbed in the struggle; while, by the former, the noise of the strife is heard only in monotones, and scarcely heeded then.

The least reflection will suffice to show any one that, until recently, in this country, circumstances have been unfavorable to the prosecution of deep scientific investigation, or patient, prolonged, and philosophical research. The means which are at the command of so many in the Old World, have been here, in a great measure, wanting. The advantages for the investigation, on the largest scale, and in the most thorough manner, of the profounder problems of life and death, health and disease, which have surrounded, for centuries past, the favored and gifted men of Europe, as found in vast hospitals, in the aggregation of men, in the encouragement given to scientific pursuits, in the immediate rewards of success, and in incentives of every kind to avail themselves of the opportunities almost thrust upon them—these advantages have not always prevailed here, nor do they now, to as great an extent as abroad. Our national growth has been too rapid to admit yet of a full literary development. We have felled forests rather than trimmed the midnight lamp—have reared great cities rather than studied great books—have built navies rather than written metaphysical philosophy. Brave hearts and strong arms, incited by a restless activity, have founded an empire, vast in extent, mighty in power. The period of repose has not yet come. The stillness of deep thought has not yet fallen upon us. The age of great scholars, and great writers, in our profession at least, may not yet have more than dawned upon us; but it has dawned, with the promise of a glorious day. As Americans, we can justly boast of Jurists whose opinions command a world-wide respect; of Historians who rival the purest classic

models of any age; of Divines who adorn even the pulpit; and, we are proud to say, of Physicians whose names the medical world, at least, "will not willingly let die." If we have few Authors worthy of the name among us, let it be remembered that there are few such anywhere. If the relative proportion of such seem too small, let it not be forgotten that whereas we see *all* of our own works, we see only the *choice ones* republished from abroad. If, indeed, we are yet in a state of comparative literary immaturity, let us remember that we have hardly had time to complete our growth, and that all systems of *forcing* are unnatural and unhealthy. If we have not wholly emancipated ourselves from traditionary dependence on foreign supplies, let us not forget that it is as unwise for a community as for an individual, to separate itself from its kind. If other people, older in their nationality than we, choose to cast a slur upon our productions, and scoff at our efforts, let us remember that it is one of the prerogatives of age to contemn the inspirations of youth, but that a wise and true manhood judges neither nations nor men by the grayness of their beard.

No depreciation of ourselves, and no impertinent sneers of others, can alter, in the slightest degree, our actual relations to the profession or the world.

The time has past when any man of character abroad, with a decent self-respect, will ask: "Who reads an American book?" And though we annually send abroad self-important medical coxcombs, who, when asked what the American profession has done for the glory of our beneficent art, are so ignorant as to hide their heads with shame for want of answer,[1] and so insolent as to report to your body *their* opinions in reference to the deplorable lack of knowledge, and the miserable shortcomings of their brethren at home; yet no one whose estimate is worth one iota, here or elsewhere, pretends to deny to our countrymen in medicine, as in philosophy, not a few of the grandest and richest practical results yet achieved by the world. Need we point to some of the boldest successes of surgery? to some of the most enduring triumphs of practical medicine? to the discovery of anæsthesia—the veritable Letheon which steeps in oblivion so much pain, and wraps in forgetfulness so many sorrows? It were idle to do so. It were equally idle to deride or undervalue our national medical record. Nevertheless,

[1] Vide memorial from American Medical Society of Paris. Transactions A. M. A., vol. vii.

it is not pretended that our medical literature is immaculate. And admitting an actual inferiority in some respects, and granting the complete inferiority assumed by some critics, it will not be amiss to examine the reasons more commonly urged as explanatory of this condition, and some of the means proposed to amend it. These may be substantially reduced to two. First, a slavish subserviency to foreign authors, and a consequent contempt for native ones; and secondly, the non-existence of an international copyright law.

The first could hardly be more forcibly stated than in a very elaborate report[1] presented two years ago to the Association by one of its special committees. "American physicians and surgeons," says the reporter, "seem to glory in being the slaves of European authority in whatever pertains to their profession both in matters of opinion and practice. Like Esau, they have bartered away their birthright for a mess of pottage; they are unwilling to learn anything that is purely American; they are too proud to acknowledge that anything good can emanate from a native author, and too stubborn to admit that one man knows more than another. They would rather at any time, lest they should seem to be indebted to their own countrymen, quote from Louis and Chomel than from Drake and Chapman, or Cooper and Brodie than Gibson or Mott. It is a *bitter humiliation* to find this tendency in our profession, a tendency so utterly at variance with the true spirit of patriotism, with our national pride and with our national advancement as a scientific and literary people. It is mortifying to see that everything in the shape of a foreign book, however shallow and indifferent, is greedily sought and patronized, to the neglect of our own productions."

Without noticing the significant fact that such complaints ordinarily issue from those who are themselves authors, we suggest that, if it be universally, or even generally, true of American physicians, that they prefer foreign to native writers, it proves either that our medical readers have no judgment, or else that the foreign authors are really the best. If the latter be the case, it is difficult to understand upon what principle of wisdom or patriotism we should prefer the meaner. He could hardly be called a wise man who would take for his daily diet peanuts instead of potatoes, because one grew on his own farm, and the other did not. But we are persuaded that there is an error of fact in regard to this matter.

[1] On the Results of Surgical Operations in Malignant Disease, S. D. Gross, M. D.

We believe it will appear, upon investigation, that directly the reverse is true—that of the whole number of *really standard* works published, as large a *proportion* of native as of foreign ones will be found in almost any physician's library—that this proportion usually augments, in an inverse ratio, to the number of volumes contained in the library, and, therefore, as the greater number of medical men possess but few books, a majority must purchase and consult principally native works.

It is easier to forget than to destroy the facts of history. If there be one thing which, above another, is noticeable in the records of our literature, it is the kindness with which the medical public has received American productions—shown not only by extending encouragement to the good, but by throwing the mantle of charity over the bad. "The writings of Dr. Benjamin Rush had a wide popularity, and were as much read by his countrymen as the productions of any contemporary European writer. Eberle was as successful as any medical author of his day. Edition after edition of his works was called for during his lifetime, and at least one has been published since his death. The first work published by Chapman, his *Therapeutics*, attracted much attention, and was generally read. Dunglison has been eminently successful as an author, and his colleague, Prof. Meigs, has been hardly less so. Few books have had a more steady sale, or been more universally approved by the profession than the *Dispensatory* of Wood and Bache, and a later production of the former has taken its rank among the standard works on the practice of medicine. Prof. Dickson, of Charleston, has produced works which have given him an enviable reputation, and are to be found widely distributed through the libraries of his brethren. Everybody knows how wide was the circulation of Wistar's *Anatomy*. Dorsey's *Surgery* soon made its way into most of the medical libraries in the country, and Gibson's *Surgery* has passed through numerous editions. The writings of Bartlett have met with universal favor, and have been profitable both to the author and his publishers. Horner, Godman, Warren, the Becks, and Dewees, have conferred honor upon their country by their labors, and an ample share of praise has been awarded to the productions of their pens. The great work of Dr. Drake, prepared at the expense of so much time and labor, was hailed by his brethren at home as a production which "did honor to American medicine."[1]

[1] Western Journal of Medicine and Surgery, June, 1854.

There are few libraries in which Condie is not represented, and the names of Miller, of Gross, of La Roche, of Leidy, of Bell, are honorably known to the profession. The list, if necessary, might be easily extended. We trust these considerations and these facts are sufficient to show the error of those who depreciate the value of native works, or underrate the good sense and patriotic instincts of their brethren.

The second point referred to, supposed to be explanatory of any existing shortcoming in our medical literature, is the absence of an international copyright law.

This demands a more serious consideration, not only because the lack of such a law has been greatly deprecated here, as well as elsewhere, and because it is urged that its enactment would be fraught with such precious results to our literature, but because the subject, in some of its bearings at least, is misapprehended, if not wholly misconceived, even by some of those whose clamor is most vociferous for it.

The question of international copyright is one of great difficulty and importance, and like every question which can be justly spoken of in that way, requires to be considered not only in a variety of lights, but is liable to determine us in opposite directions, according to the point of view from which we chiefly consider it. The private interests which are at stake might incline us to decide in one way, while the higher interests of society might compel us to decide differently. The interests of trade and the interests of knowledge might be supposed to conflict, and the pecuniary demands and rights of large and meritorious classes of persons to be inconsistent with the general progress of society.

The law is urged essentially on two pleas: First, *common honesty*, as founded upon a supposed absolute right of property in ideas; and second, *sound policy*, as touching the protection and fostering of native authors, and through them strengthening and developing a worthy national literature. A calm consideration of the question, in its most obvious and important aspects, leads us to distrust the propriety and wisdom of any such law.

In giving all their weight to the *private* interests which are involved in this question, and supposing there were no higher interests than they to be considered, it is far from clear that even in that case, the authors of books are entitled to demand exclusive property in them from their own governments, much less that they have a right to claim such a monopoly from foreign states. In most countries, where any right of this sort has been recognized as

existing in authors, and more especially in our country, with a common consent, the right itself has been considered and treated as extremely limited, instead of permanent and absolute. It is hard to say that the exclusive right in the author is clear and just, and yet to say, it is limited to fourteen years, or to any other number of years; and the moment such limitations are allowed, at the same moment the ideas of patronage and monopoly supersede the ideas of equity and of property in granting any such privileges at all. And in truth this limited right of exclusive property given by law to authors, has its true defence not in the notion of protecting private rights, which are by no means certain, but in the idea of promoting the public welfare by applying the stimulus of pecuniary reward to the production of original works. So that at last it is upon the ground of public policy, and not of private right, that States allow a monopoly for a limited period to be secured as a reward, not as a right, to the producers of books supposed to be original. And if this be the real ground of the proceeding, it would seem to be perfectly clear that citizens of foreign states are destitute of the least pretext for making any claim of right upon other governments, and that every government has the plainest reasons of public policy for excluding all except its own citizens from such rewards.

There are many considerations which appear to fortify very greatly the gravest doubts, whether copyright, or exclusive property for a limited period, is really politic and wise on the part of governments when dealing with their own citizens—much less when dealing with strangers. It is of itself, and however employed, a tax upon knowledge—an obstruction to the general progress of literature and science. If it be urged that it is correspondingly a stimulus to production, the answer is various, and apparently complete. For, let it be remembered, how immense is the proportion of this over-production which the public judgment condemns and rejects as utterly worthless. Let it be remarked how difficult it is for the *law* to determine what books are really *original*, and therefore entitled, on *any* ground, to the protection demanded for all books making such a claim; and how absurd and unjust it is for society to make itself a party to perpetual frauds and injuries, perpetrated upon the great thinkers and scholars of the race, through an endless succession of shallow plagiarists. Let it be remembered that the pursuit of literature is not a trade, but is a glorious calling, to which the poor stimulus of money patronage and legal monopoly

is more frequently a bondage than a nourishment. Let it be borne in mind, that all books that live—all intellectual progress that is high and permanent, must forever be the creation of causes and impulses utterly different from all such as are involved in questions about copyright and monopoly.[1]

In fine, let it not be forgotten that in a country and under institutions like ours, they who are to lead the grand column of human progress, ought to be the very last to obstruct the power and freedom of that progress by claims which when granted can never add to their ranks one illustrious name, nor when denied, can ever take from them a single leader capable of victory. Let these and manifold considerations like them, justly occupy our thoughts, and we can hardly fail to see how absurd it is, to imagine that the true promoters of knowledge, the real utterers of words that men will not forget, have any interests which are identical with those, whose interest it may be to obstruct the widest freedom of knowledge.

[1] Seventy years ago, in a noble argument on one branch of this subject, a great statesman (Lord Camden) said :—

"If, then, there be no foundation of right for this perpetuity by the positive laws of the land, it will, I believe, find as little claim to encouragement upon public principles of sound policy or good sense. If there be anything in the world common to all mankind, science and learning are in their nature *publici juris*, and they ought to be as free and general as air or water. They forget their Creator as well as their fellow-creatures, who wish to monopolize his noblest gifts, and greatest benefits. Why did we enter into society at all, but to enlighten one another's minds, and improve our faculties, for the common welfare of the species? Those great men, those favored mortals, those sublime spirits, who show that ray of divinity which we call genius, are intrusted, by Providence, with the delegated power of imparting to their fellow-creatures that instruction which heaven meant for universal benefit; they must not be niggards to the world, or hoard up for themselves the common stock. We know what was the punishment of him who hid his talent, and Providence has taken care that there shall not be wanting the noblest motives and incentives for men of genius to communicate to the world those truths and discoveries, which are nothing if uncommunicated. Knowledge has no value or use for the solitary owner; to be enjoyed, it must be communicated. 'Scire tuum nihil est, nisi te scire hoc sciat alter.' Glory is the reward of science, and those who deserve it scorn all meaner views. I speak not of the scribblers for bread, who tease the press with their wretched productions; fourteen years is too long a privilege for their perishable trash. It was not for gain that Bacon, Newton, Milton, Locke, instructed and delighted the world; it would be unworthy such men to traffic with a dirty bookseller for so much a sheet of a letter press. When the bookseller offered Milton five pounds for his Paradise Lost, he did not reject it, nor did he accept the miserable pittance as the reward of his labor; he knew that the real price of his work was immortality, and that posterity would pay it."

Above all, that the medical profession whose very mission is involved in the universal search, the universal recognition, and the universal dispensation of all knowledge, that by any means appertains to it, should suppose, that its rights, its interests, or its honor did not clamorously demand unfettered knowledge.

It is no doubt true, that all states should aim to do justice to all men everywhere. But it is none the less true, that the special and great end of every commonwealth is to promote in its own borders, and for its own citizens, the particular objects for which all governments are instituted. Every people may hold in grateful remembrance the benefactors of mankind; but it is only the people amongst whom they dwell, who can possibly bestow on them those more immediate rewards which appertain to high success during their brief existence on earth. It is quite absurd to allege that the people of the United States have any duty to perform towards the statesmen of other nations in the way of promoting them to honor, or the authors of strange lands in the way of advancing them to riches. We might as well pretend, that we here in America are obliged, in some mysterious way, to seek for the true heirs of Aristotle, and make laws for their pecuniary benefit, or that we are obliged to do somewhat similar for those of Milton, La Place, Sydenham, or any other glorious name amongst the dead, as that we are under like obligations to living authors in foreign countries, to make like provisions for their pecuniary advantage. Such ideas are wholly chimerical: they form no part of the motive to human effort; the pretended rights upon which they are obliged to rest are incapable of being even so much as stated in a rational manner; and the common sense of mankind, the well considered policy of states, and the calm dictates of philosophy, alike and utterly reject them.

It is indeed possible that a very small portion of the more inferior authors of a particular country, might have a certain pecuniary interest in obstructing the republication of the works of foreign authors, better than their own, in the country in which they dwell: and so might plead their own poor cause, while they appeared to plead for the rights of foreign authors to protection, in what they call their literary property. But a question of this sort—in that aspect of it—rises no higher than a question of mere profit between a limited class of writers and a limited class of publishers; in which the publishers have this advantage, that their interests happen to coincide with the interests of knowledge.

As to the great mass of books, their fate is not unlike that of the great mass of men. No doubt there is a reason why they were born, and no doubt there is a reason why they perish. This is their entire record, they were born and they have perished, and there was a reason, of some sort, for both events. But who cares to know anything further about them? Who thinks it worth while to make laws either about their birth or their death, or the particular course thereof? But in the mass of this perishing multitude, there are books which cannot die. It is of these only that there is any need that we concern ourselves, and the concern which we have with them, is that we master and cherish what is in them. Instead of obstructing their entrance amongst us, one of our highest duties is to hail and promote that entrance. Instead of increasing the difficulty of their widest circulation, our wisdom is to give them the freedom of the land. Too often it happens that the authors of such books are beyond the applause or the reproach of foreign peoples, long before their productions make free way among them; and in cases in which it is otherwise, the fame these authors achieve, and the good their works do, constitute the true and great reward which strange nations can bestow.

That men should live by literature, may be an advantage to mankind, but it is far from being one to literature itself. The progress of society necessarily involves the development of a literature peculiar to itself, and corresponding with that progress. The influence of all foreign literatures upon that which is national and peculiar in each particular country, is an element in human civilization which it is impossible to regulate by laws in any free country, half so beneficially as the laws of progress will regulate of themselves, if left to act freely. In the long run of human development, society can no more fail to produce its own authors than it can fail to produce its own rulers. The gradual and healthful process through which our literature has been passing for nearly a century, towards a perfect accordance with our ripening nationality, under the existing forms of civilization amongst us, has been promoted, if not achieved by the freest contact of the public mind, with all existing literatures. Nothing, assuredly, has occurred to make either the process, or the results yet attained, the slightest occasion of disquietude on our part. And perhaps there could be no stronger proof of the deep conviction of our people, that the interests of our national literature are inconsistent with the attempts

so long and so eagerly made, to rouse the country in favor of the scheme of international copyright, than the utter failure of that attempt, even when it has had the whole field of agitation, unquestioned, to itself.

What is to be gained, in the passage of such a law, by our medical literature it is difficult to conceive. Whatever other results might ensue from the establishment of an international copyright, these certainly would, viz: a materially increased cost, necessarily followed by a diminished circulation of foreign works; and, in order to supply the demand, a corresponding increase in the *quantity* of home productions, while an enhanced price would result from the application of this literary protective tariff. Does any man in his sober senses consider either of these results desirable? Does any one imagine that an increase in *quantity* involves a relative improvement in quality? Nay, by just so much as *authorship* is made, by legal enactments, more profitable, will it not be likely to degenerate into *book making?* Will it not cease to be a calling and become a trade? Will the law add one whit to the zeal of any explorer of the labyrinths of nature? Will it make a single observer at the bedside more careful and reflective; any student in the dissecting-room more diligent and painstaking; any thinker in his closet more profound and philosophic? Or is it credible that, as original works, the product of patient labor, rigid investigation and deep thought, are excluded from any country, base imitators or unblushing plagiarists would be *less* common than now?

Finally, the commonwealth of letters is boundless, and men of science have a *right* to a universal hearing. As no nation can possibly have the monopoly of learning or of wisdom, so no narrow sense of nationality should attempt, upon any plea or for any purpose, to shut out the productions of foreign authors; but every true man of letters should be known and honored everywhere. The annals of medicine abound in illustrious names. Let each particular country rejoice in the glory of its sons; but laborers in the cause of humanity belong to the race, HIPPOCRATES, CELSUS, BOERHAAVE, HALLER, SYDENHAM, CULLEN, PARÉ, BICHAT, RUSH, PHYSICK.

> The graves of such are pilgrim shrines,
> To no code or creed confined;
> The Delphian vales, the Palestines,
> The Meccas of the mind.

What then can be done to correct the faults of our medical literature, however great or however small they may be? Is there a remedy?

In the course of time and through the unchangeable laws of progress and development—Yes. Through the agency of this Association? No. If indeed it were able to prevent individuals yet in the "tenderest immaturity of knowledge" thrusting themselves forward as teachers; if it could make scholars of the ignorant and wise men of fools; if it could repress ridiculous ambition and boundless self-conceit; if it could persuade all writers to understand the difference between authorship and book-making; if it had the power to put down reckless plagiarists and shallow thinkers; if it could keep men from writing books by way of advertising themselves or their "schools;" if it could enforce a judicious excise on foreign importations, and wither that pestilent class of editors who "bring out" foreign works and divide glory with their authors, without sharing labor, or adding one jot or tittle to our knowledge of science and art; if indeed it had infinite power to do impossible things, it might hopefully attempt any necessary literary regeneration.

R. J. BRECKINRIDGE.
J. B. FLINT.
D. L. McGUGIN.

REPORT

OF THE

COMMITTEE ON PLANS OF ORGANIZATION

FOR

STATE AND COUNTY SOCIETIES.

REPORT OF THE COMMITTEE ON PLANS OF ORGANIZATION FOR STATE AND COUNTY SOCIETIES.

THE Committee on Plans of Organization of State and County Societies respectfully report:—

That they have had the subject assigned them under consideration, and are deeply impressed with its importance to the cause of medical improvement. Indeed, of the great desirableness of a thorough organization of our profession into State and County Societies, there can be no doubt among those who have given the subject attention.

That the American Medical Association has ever appreciated this fact, and the objects to be obtained by organization, is evinced by its repeated expressions and acts. In the preamble attached to the constitution of this body, the objects of its organization are declared to be: "For cultivating and advancing medical knowledge; for elevating and advancing the standard of medical education; for promoting the usefulness, honor, and interests of the medical profession; for enlightening and directing public opinion in regard to the duties, responsibilities, and requirements of medical men; for exciting and encouraging emulation and concert of action in the profession; and for facilitating and fostering friendly intercourse between those engaged in it." And, in order that these great objects might be effected throughout the masses of the profession and the community—that all might participate in their advantages, the Association has held out, and in the appointment of your Committee and through its efforts, strives still to hold out all possible inducements for the universal formation of State and County societies, preferring that they should be auxiliary to this body, and directly co-operate with it, in its efforts at improvement.

Your Committee are of the opinion that in no profession is there

so great a necessity for a thorough education and discipline of those entering it, and for all the aids which association may afford to improvement afterwards, as in that of medicine. In this, there are, perhaps, greater opportunities for tolerated empiricism, and stupid routinism, for baseless pretensions and reckless blunderings, than in any other.

The people are more ignorant of the principles of medical science than they are of those of the other learned professions, and, for this reason, are less qualified to judge of the acquirements of a physician than of other professional men. The talents and acquirements of the clergyman and the lawyer are brought to a more searching popular test than those of the physician. The clergyman's public ministrations are laid open to the appreciation of all. His audiences are, to a large extent, competent judges of his pulpit efforts, and if he manifest ignorance, stupidity, or superficiality; if he descends into monotonous mumblings in manner, or stereotyped commonplaces in matter, he forthwith falls in public estimation to the low level he deserves.

The lawyer is brought to a still more severe test. All his legal papers must be drawn up with the most scrupulous technical accuracy, or they will fail of their object, and be inevitably attended with palpable exposure and pecuniary loss. Here all great errors are open and apparent, involving the reputation and standing of the practitioner: and, before the bar, the lawyer is brought in open conflict and comparison with a keen-eyed opponent, before a sagacious court, fully understanding the principles which are discussed, and who indicates in his open decisions which party is in the right.

With both these latter professions there is every inducement, of a personal and selfish character, to stimulate exertion, to induce the most careful preparation, and excite the most strenuous effort; and with one of them there are other peculiar and sacred motives, extending far beyond all earthly considerations.

The knowledge and abilities of the physician in the practice of his profession, are not tested in the same direct and open manner. The character of his business is such as more or less to conceal it from public gaze. He has to do with the hidden and secret springs of life. He does not come in conflict with the same eagle-eyed opponent, and his labors are not watched and decided upon by the same sagacious and discerning judge. The grave too often conceals his blunders, and few, or none, are competent to decide whether the protracted sufferings, the lost vigor, and the shattered constitutions

of those who survive, are the necessary consequences of disease which could not have been prevented, or are the results of inefficient or injurious treatment. Indeed, so erroneous is the judgment of those by whom he is surrounded, that he is often praised for his errors, and censured for his highest skill. He sees the bold and unscrupulous pretender, ignorant alike of the diseases he treats and the remedies he employs, exalted in popular estimation for the occurrence of events to which he has in nowise contributed, and extolled for recoveries, of which the least that can be said is, his bad management did not effectually prevent them; and the honest physician often feels that varied knowledge and consummate skill, so far as popular favor is concerned, are of less consequence than the possession of other characteristics, of which, in the light of his conscience, he cannot certainly be proud. At least in this erroneous popular estimate—in this darkness which surrounds his performances, there is an absence of many of those incentives to improvement which are present with the other professions. If the physician is not a real lover of science for its own sake, or a man of genuine, active, intelligent benevolence, he has comparatively little to stimulate him to exertion; and if not thoroughly instructed in the beginning, and if his ambition is not aroused and kept alive by constant professional intercourse with the more enlightened members of the fraternity; if his knowledge be not brought to the light, where it can be seen and appreciated, he is in imminent danger of falling into a state of mental indifference and inefficiency, of lagging sadly in the march of progress, and becoming a blemish rather than an ornament to the profession, which, in more than one sense, he follows. Even the greatest lovers of science, and the best of men, require these stimulants for their full development.

Besides the influence which association has upon individual growth and character, the nature of the science itself particularly demands the organization and concerted action of those who are engaged in its cultivation. Medicine is peculiarly a progressive science. Though the facts and principles upon which it is founded are among the fixed truths of nature, the eternal laws of God, yet all those truths and laws bearing upon the subject are not yet discovered, and the varying circumstances of the influences which surround us, and the varying conditions of the mystery of life, are ever producing new and varied results, requiring continued observation, record, and comparison; and so innumerable are these hygienic, etiological, and therapeutical relations of external objects, and the peculiarities

of organization and the vital force, that the science of health, of disease, and of cure, becomes boundless in its extent, and indefinite in its progression; and, as its greater development is so important to the interests of humanity, it imperatively demands, not only the arduous, but the systematized and concerted labors of its votaries.

In considering specific laws of organization of State and County societies for general adoption, your Committee have experienced embarrassment. In the first place, they do not conceive that this body has the power or the right to dictate positively to these societies, the specific form of constitutions, in all their details, which they should adopt. This Association has doubtless the power to determine who shall constitute its members, and could, by the exercise of that power, prescribe the character of the societies which should be represented here; but, in the judgment of your Committee, it would be impolitic, if not wrong, to dictate any measures to societies other than those which are vitally important in carrying out the great principles for which this organization was established.

Almost all communities, of whatever degree of enlightenment, regard themselves as best qualified to frame, at least in the main, the instruments by which they are to be governed; and this is particularly the case in our own country, where there is so much of the spirit of independence, and where, in our political relations, we have the example of the States forming their own constitutions, and enacting their own laws, with very limited restrictions on the part of the general government. Besides, many States and Counties are already organized into societies, some of them of long standing; and, having become accustomed to particular forms which have served well their purpose, they would very reluctantly abandon them for others they had not tested. Indeed, some societies are established by the laws of the States in which they are located, are endowed with certain legal powers and privileges, and provided with specific constitutions which could not be altered without statutory provisions on the part of those States.

In view of these facts, your Committee do not deem it advisable to present, in detail, forms of constitutions for this Association to peremptorily prescribe to all State and County societies. They will, however, at the close of this report, present the outlines of a constitution for a State, and one for a County society, of the most simple form, as suggestive guides to those States and Counties where societies are not organized, or where it may be thought their organizations require remodelling.

There are, however, some provisions which your Committee deem essential to the carrying out of the leading specific objects of this Association, and, therefore, within its province to urge upon those societies which seek a representation here, if not to insist upon them by all the power which it possesses. These are certain specific means for "elevating the standard of education" among medical men, and particularly of "preliminary education;" and of "cultivating and advancing medical knowledge." The standard of education, and particularly of academic education, for admission into the profession, is universally acknowledged to be by far too low. Indeed, in regard to academic acquirements, there is, among the schools, scarcely a standard at all. This remark has not reference to exceptions, but is intended to have a general application among us; and we are sorry to learn, from a recent "Introductory Lecture to the Medical Session of the University of Dublin, by William Stokes, M. D., Regius Professor of Physic," that this state of things is not confined to our own country. In the lecture, he says: "I can speak on this subject" (of merely special or professional education, while neglecting general or academic) "with confidence, for I have now been more than twenty-five years occupied in the teaching of clinical medicine, and I know that some of our students have obtained their diplomas from various licensing bodies, without possessing the knowledge indispensable to a common clerk."

As to the most efficient means of elevating the standard of education, preliminary and professional, which, at the time of its inception, was the governing motive in establishing this Association, there seems at present to be some differences of opinion. Hitherto, the power of the Association, at least such power as is contained in recommendations and resolves, has been expended chiefly, though in most instances it must be confessed, almost vainly, upon the schools. These institutions have by most been considered as mainly responsible for the low standard of admission to the profession which all acknowledge to exist. They certainly have the power to make their own regulations; to dictate their own terms for the admission of students; to prescribe the extent of instruction given them, the length of time it shall continue, and the amount of knowledge of every kind they shall possess before receiving medical honors. It is well known, and by none better than by those connected with the schools, that many students, without appreciating their best interests, will seek for the most easy and rapid attainment of a degree; and the schools being charged with the principal

labor of furnishing instruction, and being placed by their licensing powers as the guardians of the public and the profession, are regarded as most solemnly bound to exclude all from the privileges and honors they are capable of bestowing, who will endanger the safety of the public, or the honor of the profession.

In order to diminish the weight of this responsibility, especially in regard to preliminary education, some connected with the schools have charged the private members of the profession with dereliction of duty in receiving persons into their offices as students of medicine, without regard to their mental, moral, or educational fitness for becoming respectable physicians, and thus furnishing the schools with defective materials; and private members have even been charged with encouraging students to attend those schools where diplomas are most easily obtained; and it is therefore contended that the professional standard is to be most effectually elevated by inducing private preceptors to allow none to come under their instruction who are not qualified by original capacity, by education and discipline, to do honor to the profession and serve usefully the community.

Without attempting to shield the schools in the slightest degree from the responsibility which necessarily belongs to those who assume to qualify young men for the practice of medicine, and to judge of their fitness for doing justice to their calling—in fact, to induct them into the profession—your Committee are nevertheless of the opinion that there is much force in the charges against the body of physicians, and that they have responsibilities in this matter which they cannot evade.

To bring the profession at large to co-operate in the elevation of its own character, and believing that upon them and their action, more than upon corporations, must the reform which is sought ultimately depend; your Committee recommend that all local or county societies represented in this body, be directed to incorporate into their constitutions or by-laws, provisions for the election of a Board of *Censors*, whose duty it shall be to examine all persons applying for admission as students of medicine into the offices of any members of such societies, and that no member shall admit any student into his office until he shall receive from the board of censors a certificate that he possesses a good moral and intellectual character; a good English education, including a thorough knowledge of the English language, and a respectable acquaintance with its literature and the art of composition; a fair knowledge of the

natural sciences, and at least the more elementary mathematics, including the main elements of algebra and geometry, and such an acquaintance with the ancient languages as will enable him to read current prescriptions, and appreciate the technical language of medicine.

Your Committee hope that the propriety of this measure will be sufficiently apparent to this body to secure its favorable consideration. Nothing need here be said of the importance of a respectable preliminary education and the possession of a good mental and moral character by those entering upon the study of medicine. With regard to education, it is well known that early deficiencies are seldom supplied in after life, and a want of mental discipline and ignorance of language will obstruct often irremediably the course of successful study; and without the possession of proper mental and moral qualities, all attempts at obtaining respectability in the profession will of necessity be futile. Here is the great foundation of the evils under which we suffer, and the removal of this foundation is positively essential to the complete redemption and preservation of our body from degradation and dishonor. If the profession, to any considerable extent, be filled with men of feeble, unprovided, or undisciplined intellects, of indifferent morals, and of boorish manners, it will as a body receive, as it will deserve, the disrespect, if not the contempt of an intelligent community; and in the pursuit of the science of medicine, as in everything else, there must be an adaptation of men and means to the object to be accomplished, and there must be a proper beginning to secure a successful issue.

It is quite obvious that at the commencement of professional studies, at the point of determining a course for life, is the proper time for testing preliminary preparation, and general mental and moral fitness, and it is important for the schools to erect a standard on these subjects, only because it is neglected by those who have charge of students at the beginning of their professional course. But if this were not the most natural and proper time for such examinations, the fact that the schools have so generally and for such a length of time neglected the recommendations of this body, affords sufficient reason for directing the efforts of the Association to a point where efforts have not yet been proved to be useless. When the Jews would not receive the ministrations of Paul and Barnabas, the great apostle exclaimed: "Lo, we turn to the Gentiles."

It has already been intimated that the cultivation and advance-

ment of medical knowledge is another principal object of all our organizations. In a science like that of medicine, based less upon theoretical speculation and *à priori* reasoning than upon definite and observed facts, it is obvious that the most direct and certain mode of increasing its knowledge is by the careful observance and record of these facts; and it is equally obvious that the more numerous are the facts thus observed and recorded—the more they partake of the character of extended statistics—the more positive will be the knowledge obtained, and the more reliable the inferences drawn. Indeed, the most prolific source of error in medicine, both as regards etiology and therapeutics, consists in drawing general conclusions from a limited and insufficient number of facts, or from facts occurring under peculiar circumstances.

It has ever been a desideratum of the first importance, to obtain careful, minute, and extended reports of the local prevalence of diseases, the peculiar characters which they may present, and the peculiar circumstances attending them, as regards their cause, their nature, and their treatment. Such reports not limited to public institutions or to large towns, which would be but imperfect, often erroneous guides to those in the walks of private practice and in rural districts, nor restricted to one season in which the "epidemic constitution" may differ from the next, but obtained from a great variety of sources, extending over a lengthened period of time, and in a properly arranged and condensed form placed permanently on record, accompanied with full meteorological notations and topographical descriptions; and this going on from year to year through cycles of epidemic changes, would at length accumulate a mass of facts such as has never yet been afforded to medical science, and from which could be drawn reliable scientific and practical deductions, valuable beyond the bounds of human computation. In the opinion of your Committee the accomplishment of this end should be among the chief purposes in all our associations.

This great object, so worthy of a great effort, can alone be accomplished by a full organization and a concert of action throughout the masses of the profession. In proportion to the extent of this work would be its perfection. As suggested in the remarks just made, inferences drawn from observations on these subjects, of one or a few, are liable to error from the existence of peculiar circumstances and fortuitous occurrences; but by the accumulated observations of many, the errors from the few are corrected, and positive truth is approximated.

Your Committee would therefore recommend that all local or County and State societies, which are to be represented in this body, shall have incorporated into their constitutions or by-laws provisions which shall make it the imperative duty of all members of local or County societies to keep at least a brief record of all cases in their practice depending upon local or general causes, and report as often as annually the number or percentage of each disease occurring during each month, giving the age, sex, and hygienic conditions of the patients, the types of the disease, and the general plan of treatment, together with the results, to a committee of the society to which they belong, which committee shall collect these individual reports, arrange them in due form, adding such remarks as may be necessary, and transmit them to a committee of the State society to be added to other similar reports from the various County societies of the State, and arranged in a collected form and reported to a committee of this Association, to be again collated or tabulated if necessary, and go in a condensed form into its published transactions.

This plan, as will be seen, contemplates a mutual adaptation of these different societies to each other, and to the accomplishment of the end in view. It makes the County auxiliary to the State societies, and these, in turn, auxiliary to the National Association. It contemplates the creation of a new committee or committees, of this body, which might perhaps take the place or perform a part of the duties of the present committees on epidemics, or if thought more desirable, the reports from the several State societies might be sent to the Committee on Epidemics, for the States to which they belong. The object will be attained, if these accumulated facts are by any means placed in a proper form, easy of reference, upon the permanent published records of the Association.

It may be thought that the recording and reporting of cases as contemplated in the foregoing plan, will involve more labor than the majority of members of local societies can be induced to perform; but your Committee are confident in the opinion that it will require comparatively little labor, and that when once engaged in, and the habit is formed, it will by no means be considered a burden.

If a margin be left upon the day-book or the visiting list, or a blank leaf be inserted, or a small case-book be kept, the name of the disease and such brief notes as are contemplated in the plan, can be easily inserted, and these can be readily posted up, from month, to month, with such remarks as may indicate the topography, con-

cerned, the state of the season, the general character the particular disease has assumed, the course pursued, and the results which have followed.

The committees of the County societies will not find their labors great, or their tasks irksome. The figures from the reports of individual members can readily be added together, and the percentage of different diseases shown, and such general statements can without difficulty be made as the facts demand.

For the purpose of giving the facts respecting the prevalence of diseases their full value, the complete meteorology of the region must be kept. This needs to be done only by a single individual, for a considerable region, and there are other purposes than medical, which call for the keeping of these records. The Smithsonian Institute, a few years since, undertook the accomplishment of this task on a large scale and in many localities, and it is hoped that it may go on and fully succeed in so laudable an undertaking. Should it not, the united effort of the profession might, it is hoped, induce the local civil authorities of each township and corporation to make it the duty, for a proper compensation, of some of its officers to keep such a register and allow copies to be taken for all useful purposes.

For the purposes of our profession they should be very full. The temperature, the moisture, the direction and amount of winds, the amount of sunshine and of cloudy weather, of rain and snow, the pressure of the atmosphere, its electrical state, so far as is possible the state of terrestrial magnetism, the indications of ozone, and whatever else of external circumstances may be supposed capable of affecting the human organism.

It can but be seen that the value of the facts which might, by the plan thus briefly pointed out, in course of time, be accumulated from every part of the country, would infinitely more than reward in its results the labor bestowed.

Dr. Graves, of Dublin, some years ago proposed the establishment of medical observatories in different parts of the world, for the purpose of comparing epidemics and endemics of different regions with their meteorology, and the great Humboldt has urged the same idea. Your Committee propose, and ask this Association to exert all the power it may possess, to establish a medical observatory in every inhabited township throughout this vast country, adding thereby the force of great numbers to the strength of conclusions.

To afford a partial illustration of the interest of this subject, reference may be had to the work of the lamented Dr. Samuel Forry, upon "The Climate of the United States and its Epidemic Influences, based on the Records of the Medical Department and Adjutant General's Office of the United States Army." This little work, though embracing the diseases and partial meteorology of the military posts of the country only, is justly regarded as among the most valuable products of our indigenous medical literature. And here your Committee are constrained, for the purpose of doing justice to an illustrious statesman of the recent past, to say, that during his administration of the War Office, the meteorological observations upon which Dr. Forry's work is based, had their origin in the enlarged views of the late John C. Calhoun.

But not only will these records be useful for the vast accumulation of facts which will thus be made accessible to future medical philosophers, and rendered available for a more thorough understanding of the cause, prevention, and cure of disease, but their reading and discussion will add great interest to the meetings of societies, as well as utility to their operations, and, it is hoped, will thus cause those societies to be more regarded, and their meetings better attended. This is conceived to be an important object of the plan proposed. One of the chief difficulties in sustaining medical societies is the want of scientific interest given to their meetings, and the appearance of inutility which so often attends their operations. In our practical times, that which is not palpably useful is not regarded as worthy of existence, and if no prominent object of practical utility is apparent in organizations of this kind, they will be regarded with indifference by practical men, and will fall, as many have fallen, into decay.

Besides these advantages of the system proposed, the habit of careful observation and accurate record of cases which it requires, will have a most decided effect upon the professional improvement of individuals. By it their observing powers will be exercised and developed. Not forming erroneous conclusions in consequence of having distinctly remembered only a few of the cases occurring in their practice, which, from some attending circumstances, most strongly impressed them, while many others, possessing no less importance, and perhaps attended with different results, legitimately leading to other conclusions, have been overlooked and forgotten, they will profit by their own experience, as well as by that of others, and, furthermore, will be excited to higher efforts by being

made lively working members of the societies to which they belong, and useful contributors to a great general result.

Of the correctness of these views, and the abstract importance of this subject, your Committee conceive there can be no doubt. The only question that can exist, is, as to the complete practicability of the measure proposed—as to the possibility of bringing the mass of the profession to actually perform the labor required. While fully appreciating the difficulties of changing to any important extent the habits of great numbers of men, and fully understanding that great movements of this kind are not usually effected without much effort and time, yet there is believed to be in this proposal no insuperable obstacles to its complete success.

Nothing certainly is in the way but an insufficient appreciation of the importance of the subject, an indifference to its demands, and habits of indolent procrastination on the part of medical men; and may we not hope that if the subject be properly presented by individual and associated action, by the voice and by the press, there will be found sufficient love of science and improvement, of humanity and of truth, to sweep away all obstacles, and carry the American medical profession to *one* position of honor to which no other body of men has yet attained?

In connection with the subject, the discussion of which is now concluded, and which is but one element, though one so important in the organization of State and County societies, your Committee would suggest that for the purpose of encouraging the production of papers of interest and value, that provision be made for transmitting those read before the County societies, which may be judged by them to possess peculiar interest or a high order of merit, to committees of the State societies, to be presented by them to those bodies, and if thought worthy, to be incorporated into their proceedings, and also that each State society have the privilege at its annual meetings of sending what may be judged its most valuable papers to this body, to be considered by a committee, and if thought by them proper, to be presented at its meetings, and be published with its Transactions.

Your Committee would also suggest that in arranging the details of the working of societies, attention should be paid to a proper division of labor. Special subjects should be referred to those members who, from their mental aptitudes, their previous studies, or their peculiar positions, are best qualified to treat them.

Regarding the Code of Medical Ethics of this Association as dic-

tated by wisdom and justice, and believing it important that every member of the profession should be familiar with its high-toned sentiments, and be governed by its pure morality, your Committee would recommend that it be adopted by all medical societies, and published with their constitutions and by-laws.

In conclusion, your Committee beg leave to present to your consideration the following resolutions, containing a summary of the principal views embodied in this report:—

1. *Resolved*, That the American Medical Association, appreciating the vast benefits to the advancement of medical science, to the profession, and to the interests of humanity, arising from the efficient organization of medical men, call with deep earnestness upon physicians everywhere throughout the country, to form themselves into County and State medical societies.

2. *Resolved*, That this Association earnestly recommend to all County Medical societies to incorporate into their constitutions or by-laws provisions for the election of a Board of Censors, whose duty it shall be to examine all persons who may apply for admission into the office of any member of the society as students of medicine, and also to incorporate provisions to prevent any member of such society from admitting as a student any person who shall not first receive from the Board of Censors a certificate of a good moral and intellectual character; a good English education, including a thorough knowledge of the English language, and a respectable acquaintance with its literature, and with the art of composition; a fair knowledge of the natural sciences, and at least the more elementary mathematics, including the chief elements of algebra and geometry, and such a knowledge of the ancient languages as will enable him to read current prescriptions and appreciate the technical language of the natural sciences and of medicine.

3. *Resolved*, That this Association also earnestly recommend to local or County societies to incorporate into their constitutions or by-laws provisions for making it the duty of each of their members to keep at least a brief record of all cases occurring in his practice depending upon endemic or general causes, and report at least annually to a committee of the society to which he belongs the number or percentage of different diseases occurring during each month, together with the particular type of each disease, the chief modifying circumstances under which it occurred, the general plan of treatment, and the results of the cases; and also that these societies make provision for the election of such committee, whose duty it

shall be to receive and collate such reports, arranging them in due form, and adding such remarks as may assist to their proper understanding, and to transmit them annually thus arranged to a committee of the State society to which the local or County society shall be auxiliary; and this Association further recommends that the State societies make provision in their constitutions or by-laws for the appointment of a committee whose duty it shall be to receive such reports from the local or County societies to again arrange them with other reports from similar societies, placing them in a condensed or tabulated form, and report them annually with proper remarks to a committee of this Association to which the State societies are recommended to become auxiliary.

4. *Resolved*, That this Association make provision for the reception of these reports from the State societies, by a committee or committees, whose duty it shall be to arrange them in proper form, adding such illustrative remarks as may be deemed proper, and to report them to this Association, with a view of having them published with the other transactions of this body.

5. *Resolved*, That this Association recommend the adoption of its Code of Medical Ethics to all societies auxiliary to it, and that they record or publish said code with their constitutions and by-laws.

6. *Resolved*, That, in the opinion of this Association, it would tend to the production of papers of greater merit, and increase the interest of the meetings of local or County societies, if those papers possessing peculiar merit were referred to the State Society as marks of honor, and to be incorporated into their proceedings, if deemed worthy.

7. *Resolved*, That, in arranging the details of the practical workings of societies, due attention should be paid to a proper division of labor, special subjects for investigation and report being referred to members who, from their mental aptitudes, their previous studies, or their peculiar opportunities or positions, are best qualified and most inclined to do them justice.

The following simple outline forms of constitutions for State and County societies are attached, not as examples to be implicitly followed, but as affording suggestions for those engaged in forming new organizations, and, at the same time, for furnishing an opportunity for presenting an illustrative detail of those features which may be considered as comparatively novel, and which have been urged as important in the report. These provisions, which are thus developed, may be ingrafted into the constitutions of societies already in existence, or enacted by them into by-laws.

PLAN OF CONSTITUTION FOR STATE SOCIETIES.

Article I.

This Society shall be called the Medical Society of the State of ————, and shall be auxiliary to the American Medical Association.

Article II.

The objects of this Society shall be the advancement of medical knowledge, the elevation of professional character, the protection of the interests of its members, the extension of the bounds of medical science, and the promotion of all measures adapted to the relief of suffering, and to improve the health and protect the lives of the community.[1]

Article III.

Should specify who are to constitute members, the mode of their election, paying initiation fee, &c.

Article IV.

Officers shall be President, Vice-President, Secretary and Treasurer, and a Board of Censors, &c. Mode of election.

Article V.

Duties of Officers.—President, Vice-President, Secretary and Treasurer as usual. Censors depending upon the laws of the State, &c.

Article VI.

Meetings.—Time of holding, &c.

Article VII.

Respecting Funds.—How raised and appropriated.

Article VIII.

The Code of Ethics shall be that of the American Medical Association.

[1] This article and many of the other features of this plan, are taken from the constitution of the Medical Society of the State of Pennsylvania.

ARTICLE IX.

County societies may be formed auxiliary to this Society. Mode of formation. Who shall be members, &c. These things often depend upon the law of the State.

ARTICLE X.

There shall be a Standing Committee of this Society composed of such numbers and chosen in such manner as the Society may direct, whose duty it shall be to receive reports of cases of disease occurring in each county from committees where County societies exist, as provided for by the County societies auxiliary to this, or from individuals where County societies do not exist, and to arrange such reports in a condensed or tabulated form, adding such general remarks as may be deemed necessary, and then transmitting them to the committee of the American Medical Association appointed to receive them. Such reports are to be read either in full or by abstract at some meeting of this Society, by the committee of the County society or the individuals reporting them, or by the committee of this society receiving them, as the society may direct.

ARTICLE XI.

Provision for amendments.

PLAN OF CONSTITUTION FOR COUNTY SOCIETIES.

ARTICLE I.

THIS Society shall be called the ———— County Medical Society, and shall be auxiliary to the Medical Society of the State of ————.

ARTICLE II.

Should state the object of the Society.

ARTICLE III.

Members.—Of whom composed. Regular practitioners, &c. How elected.

Article IV.

It shall be regarded as the imperative duty of each member of this Society to keep a record of all cases occurring in his practice, depending upon endemic or general causes (such diseases as the different forms of fever, of inflammations, diarrhœa, cholera, tuberculosis, &c. &c.), together with the types they assume, the age, habits, and other hygienic conditions of the patient, and also the general course of treatment pursued, and the termination of the cases; and to report at least annually the absolute number of each disease, or the percentage as compared with the whole number of cases recorded, each month being reported separately, to the committee appointed to receive such reports, as provided for in Article X. These reports are to be read at some meeting of this Society, either by the individual reporting them, or by the committee receiving them as the society may direct.

It shall be considered as a dereliction of duty, punishable as the by-laws may direct, for any member of this Society to admit into his office as a student of medicine, any person who shall not first present a certificate of qualifications as provided for in Article VI. of this constitution.

Article V.

The officers of this Society shall consist of a President, Vice-President, Secretary, Treasurer, and three Censors.

Article VI.

Duties of President, Vice President, Secretary, and Treasurer, as usual.

It shall be the duty of the Censors to examine all persons applying for admission to the offices of any members of this Society as students of medicine, and if found worthy, to give them certificates of possessing a good moral and intellectual character; a good English education, including a thorough knowledge of the English language, and a respectable acquaintance with its literature and with the art of composition; a fair knowledge of the natural sciences, and at least the more elementary mathematics, including the chief fundamental elements of algebra and geometry, and such a knowledge of the ancient languages as will enable him to read current prescriptions and appreciate the technical language of the natural sciences and of medicine.

ARTICLE VII.

Meetings.—When held. How called, &c.

ARTICLE VIII.

Funds.—How raised and expended, &c.

ARTICLE IX.

This Society shall adopt the Code of Medical Ethics of the American Medical Association.

ARTICLE X.

There shall be a Standing Committee of this Society, of such numbers and chosen in such manner as the Society by its by-laws may direct, whose duty it shall be to receive records of cases occurring in practice from the members of the Society, as provided for in Article IV. of this constitution, to arrange them in a condensed form, showing for each month of the year the percentage of each form of disease reported, adding accounts of the localities where they occurred, the general habits, and other hygienic conditions of the people, the general meteorological characters of each month, and statements of the type or severity or other peculiarities which each particular disease may have assumed, the general course of treatment pursued, and the general results of treatment or the termination of cases; and to transmit such accounts annually to the committee for receiving them of the State Society to which this Society is auxiliary.

ARTICLE XI.

Provisions for altering or amending this Constitution.

A. B. PALMER, *Chairman.*
N. B. IVES.

REPORT ON THE CHANGES

IN THE

COMPOSITION AND PROPERTIES

OF THE

MILK OF THE HUMAN FEMALE,

PRODUCED BY

MENSTRUATION AND PREGNANCY.

READ BEFORE THE

AMERICAN MEDICAL ASSOCIATION,

ANNUAL SESSION OF MAY, 1856.

By N. S. DAVIS, M.D., &c.

CHICAGO, ILLINOIS.

REPORT ON THE CHANGES

IN THE

COMPOSITION AND PROPERTIES OF THE MILK OF THE HUMAN FEMALE, PRODUCED BY MENSTRUATION AND PREGNANCY.

At the annual meeting of this Association in May, 1855, I had the pleasure of submitting a brief report on the best methods of preserving milk in a state of freshness and purity during long periods of time, and I now propose to occupy your attention with such facts and observations as I have been able to collect concerning the other important topics referred to your Committee for investigation.

The opinion has long been prevalent, both in and out of the profession, that the milk of mothers who have become again pregnant during the period of lactation is not capable of affording a sufficient amount of healthy nutritive matter for the proper nutrition and development of the nursing infant. The number of recorded observations calculated to form a basis for this opinion is very small; and so far as I have been able to learn, no attempts have been made, either by microscopic or chemical examinations, to ascertain the precise changes, if any, which take place in the milk in consequence of the supervention of pregnancy or menstruation. In Hassall's work on microscopic anatomy, we find only the following paragraph: "The milk of women in whom the natural periods have returned during the course of lactation has likewise been carefully examined. Except in a single instance, however, it has not been found to present anything remarkable in its characters. In the case referred to, it had degenerated to the condition of colostrum, and contained the granular colostrum corpuscles."

Lehmann, in his work on *Chemical Physiology*, just issued from

the press in this country, says, in speaking of the morbid changes in milk, that "Epithelial cells, mucous corpuscles, fibrinous clots, blood corpuscles, infusoria (vibrio bacillus), and byssus (blue milk), are rare admixtures, purely accidental, or caused by pathological affections of the mammary glands."

Dr. Carpenter and other writers allude to the subject in the same general terms. Being unable to find already on record any number of analyses of milk secreted during either menstruation or pregnancy, I have embraced every opportunity afforded me during the past year for making such analyses, both chemically, and with the microscope.

Analyses of healthy human milk have been made by Simon, L'Heretier, Chevallier and Henri, Vernois, and several others; and the results obtained by them clearly establish the fact that the relative proportion of the constituents of healthy milk varies much in different individuals, and even in the same individual at different times, and under the influence of variations in diet, exercise, &c.

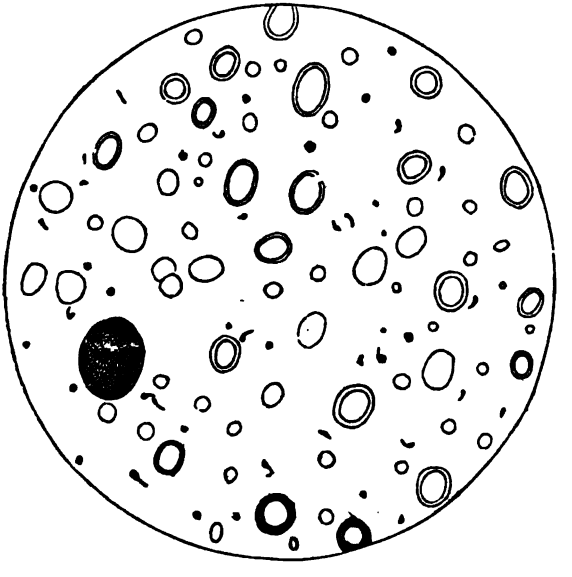
To obviate, as far as possible, any erroneous inferences from the occurrence of these normal variations, I have in this report placed in comparison only the milk of the same female, taken at different periods of time, but under circumstances in regard to diet, exercise &c., as nearly uniform as possible. To determine the effects of pregnancy on the composition and properties of milk, I obtained from Mrs. G., an intelligent American lady, aged about 27 years, when in the eighth month of lactation she was again found to be nearly three months advanced in pregnancy, an ample supply of milk for examination. At the same time, a careful record was made concerning her health and that of her nursing child. She passed through the full period of pregnancy, underwent a safe delivery; and when in the third month of lactation, free both from menstruation and pregnancy, she again supplied me with a sufficient quantity of milk for a full examination.

For another comparison of the same kind, I obtained from Mrs. B., an Irish woman, aged about 35 years, when in the eleventh month of lactation, and the beginning of the sixth month of pregnancy, one specimen of milk, and another specimen after she had completed her period of gestation, and again arrived at the fourth month of healthy and uncomplicated lactation.

To determine the influence produced by menstruation, I obtained from Mrs. W., an intelligent American lady, aged 25 years, when in the seventh month of lactation, free from menstruation, and

nursing a very healthy and well-nourished baby, an abundant supply of milk. Four months subsequently, she began to menstruate, and continued to do so regularly, and the same time nurse her infant, until the fourteenth month of lactation. During the period intervening between the second and third menstrual discharges, she furnished four more samples of milk for examination and analysis. All the specimens of milk examined were subjected to the same processes, and with a view of determining in each, first, the microscopic appearances; second, the relative proportion of cream which would separate by standing; third, the relative proportion of water and solid matter; and fourth, the relative proportion of each of the following ingredients, viz: water, butter, or oil soluble in ether, casein, sugar and extractive matter, and salts. To accomplish the first object, each specimen of milk, soon after its removal from the breast, was subjected to a careful examination under a good achromatic lens, magnifying 1000 diameters. The first two specimens, which were obtained from females in the state of pregnancy, presented appearances strikingly similar. A carefully executed sketch of the field, as it appeared under the microscope while examining the milk of Mrs. G., is herewith shown in Fig. 1. To

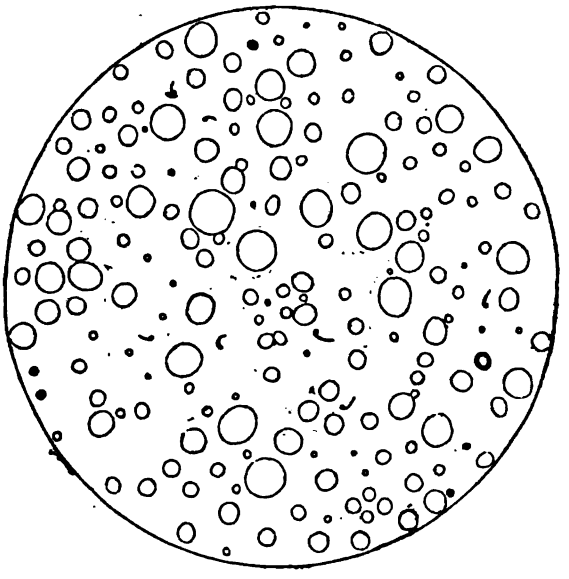
Fig. 1.



Mrs. T. G., 8th month lactation, 3d month of pregnancy.

facilitate the comparison, I have represented (Fig. 2) the appearances of another specimen of milk, obtained from Mrs. G. after she

Fig. 2.



Mrs. T. G., 3d month lactation.

had nursed her second child three months, and was free from the influence of either pregnancy or menstruation. Several microscopic peculiarities were easily recognized in the specimen first examined.

The globules or milk corpuscles were comparatively very few in number, and their size either very large or very small; the medium sized corpuscles being the most deficient. Of the larger sized corpuscles some were distinctly oval, and most of them appeared to possess double cell-walls, one within the other, precisely as described by Turpin.[1] A few true colostrum corpuscles were also found in both the specimens of milk from the pregnant females. Only one of them was present in the field represented in Fig. 1.

There was also observed in these specimens of milk a greater number of exceedingly minute globules of low refracting power, which are supposed to be composed of casein by MM. Quevenne and Donné.

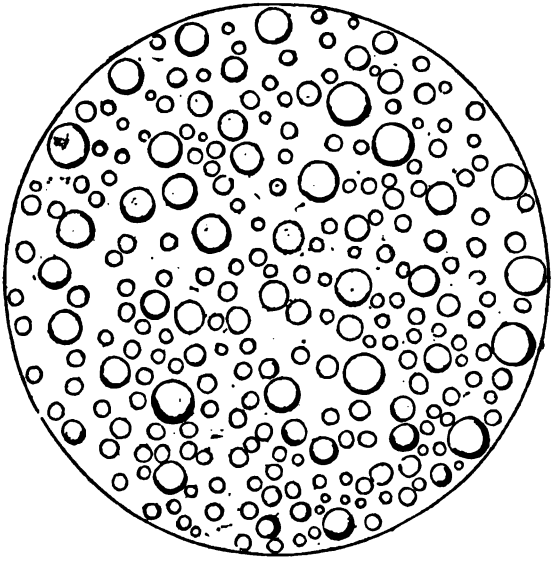
[1] Annales des Sciences Naturelles.

In the plates they are mostly represented as small black spots.

Another highly interesting peculiarity noticed in the milk of Mrs. G., while in a state of pregnancy, was the presence of a considerable number of exceedingly small animalcula. Some of them appeared to be perfectly linear, like vibrios; while others were evidently enlarged at one end, somewhat resembling the human spermatozoa, though much smaller and the tail less filiform. They were all capable of an independent, though vibratile or wriggling motion, by which they were sometimes seen to move from one-fourth to one-half of the distance across the field. After repeated and careful observations, I am satisfied that the motions here described were wholly independent of any accidental motion of the fluid under examination. These apparent animalcula are very correctly represented in Fig. 1. They were also visible, though fewer in number and smaller, in the milk of the same woman when not pregnant, as represented in Fig. 2. Aside from this the milk represented in Fig. 2, presented no microscopic appearances different from ordinary specimens of healthy milk.

In comparing the microscopic appearances of the two specimens of milk furnished by Mrs. W., one before and the other after the return of menstruation, three points of difference were noticed. In

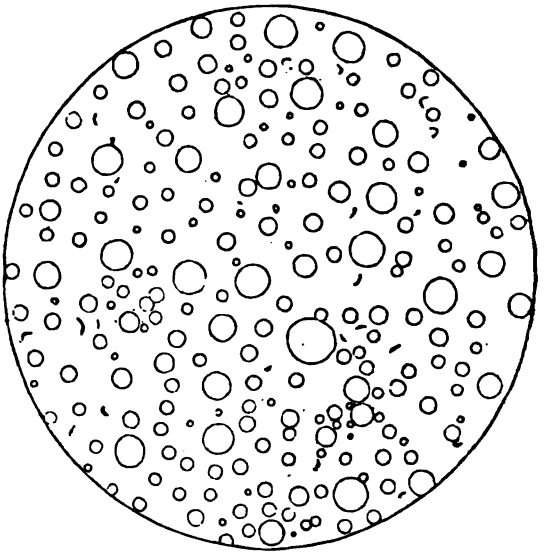
Fig. 3.



Mrs. W., 7th month lactation, no menstruation.

the latter, the true milk globules were decidedly fewer in number; a larger proportion of them were very small; and a small number of exceedingly minute animalcula were visible. These differences are very accurately represented in Figs. 3 and 4. To ascertain the

Fig. 4.



Mrs. W., 13th month lactation, menstruated twice.

relative proportion of cream which would separate spontaneously, a certain quantity of each specimen of milk was allowed to stand in an open tube 36 hours, when the thickness of the stratum of cream was readily determined by measurement. The milk of Mrs. G. obtained when she was in the 8th month of lactation, and the 3d month of pregnancy, exhibited a quantity of cream equal to $\frac{1}{16}$ part of the whole bulk of milk. That obtained from Mrs. B. when in the 11th month of lactation, and the 6th month of pregnancy, exhibited cream equal only to $\frac{1}{20}$ of the whole quantity of milk. The milk received from Mrs. G. during the 3d month of the 2d lactation, yielded a proportional bulk of cream fully equal to $\frac{1}{8}$; and that obtained from Mrs. B. during the 4th month of the 2d lactation, gave $\frac{1}{12}$.

These are striking differences, and well worth careful consideration. The milk furnished by Mrs. W. when in the 7th month of healthy and uncomplicated lactation, the same as represented in

Fig. 3, also yielded an amount of cream equal to $\frac{1}{8}$ of the whole. Two other specimens, furnished by the same woman during the 13th month of lactation, after having menstruated two consecutive months, yielded the one $\frac{1}{10}$, and the other $\frac{1}{11}$ of their whole bulk.

The following tables exhibit the results of nine separate chemical analyses, all conducted in the same manner. First, the milk of Mrs. B. when in the 11th month of lactation and the 6th month of pregnancy.

	Whole amount analyzed 475 grs.	Proportion in 1000 parts.
Solid matter by evaporation	27.5 grs.	57.90
Water	447.5 grs.	942.10
Of the solid matter there was—		
Butter or oil soluble in ether	6 grs.	12.63
Sugar and extractive matter	10 grs.	21.05
Casein	11 grs.	23.16
Fixed salts	0.5 grs.	1.06

Second, the milk of Mrs. B. when in the 4th month of her second lactation, uncomplicated by pregnancy.

	Whole amount analyzed 829 grs.	Proportion in 1000 parts.
Solid matter by evaporation	94 grs.	113.39
Water	735 grs.	886.61
Of the solid matter there was—		
Butter or oil soluble in ether	19 grs.	22.92
Sugar and extractive matter	24 grs.	28.50
Casein	48 grs.	57.90
Salts	3 grs.	4.07

Third, the milk of Mrs. G. in the 8th month of lactation and the 3d of pregnancy.

	Whole amount analyzed 475 grs.	Proportion in 1000 parts.
Solid matter by evaporation	32 grs.	67.36
Water	443 grs.	932.64
Of the solid matter there was—		
Butter or oil soluble in ether	8 grs.	16.84
Sugar and extractive matter	11 grs.	22.10
Casein	12 grs.	25.26
Salts	1 gr.	2.10

Fourth, the milk of Mrs. G. in the 3d month of the second lactation, without pregnancy or menstruation.

	Whole amount analyzed 205 grs.	Proportion in 1000 parts.
Solid matter by evaporation	24 grs.	117.07
Water	181 grs.	882.93
Of the solid matter there was—		
Butter or oil soluble in ether	8 grs.	39.02
Sugar and extractive matter	6.5 grs.	31.70
Casein	8.5 grs.	41.46
Salts	1 gr.	4.87

Fifth, the milk of Mrs. W., at the end of the 7th month of lactation, without menstruation or pregnancy, the nursing child being very robust and healthy.

	Whole amount analyzed 1500 grs.	Proportion in 1000 parts.
Solid matter by evaporation	203 grs.	135.34
Water	1297 grs.	864.66
Of the solid matter there was—		
Butter or oil soluble in ether	67 grs.	44.67
Sugar and extractive matter	55 grs.	36.66
Casein	75 grs.	50.00
Salts	6 grs.	4.00

Sixth, the milk of Mrs. W., in the 13th month of lactation, and the third month of menstruation. The table presents the average results of four separate analyses.

	Whole amount analyzed 1467 grs.	Proportion in 1000 parts.
Solid matter by evaporation	137 grs.	93.38
Water	1330 grs.	906.62
Of the solid matter there was—		
Butter or oil soluble in ether	44 grs.	29.99
Sugar and extractive matter	41 grs.	27.94
Casein	48 grs.	32.71
Salts	4 grs.	2.72

If we may deduce conclusions from the limited number of observations and analyses here detailed, we may find a very definite answer to the question under consideration, so far as it relates to the changes in the *composition* of the milk.

1st. The occurrence of pregnancy during lactation, produces a very marked diminution of all the solid or nutritive constituents of the milk, such diminution continuing to increase as the pregnancy advances.

2d. In examining the separate proximate constituents, it will be observed that a much greater relative diminution takes place in the

casein, the butter or oil, and the salts, than in the sugar and extractive matter.

3d. There appears to be added to the milk secreted during the progress of utero-gestation some of the *granular* bodies or colostrum corpuscles, and numerous minute infusoria or animalcular germs, which have been very rarely found in healthy milk.

4th. Changes, the same in kind, take place in the milk secreted after the establishment of regular menstruation, but much less in degree; and the relative diminution of the several constituents is more uniform.

Changes in the Qualities of the Milk.

These may be inferred partly from the previously ascertained changes in its composition, and partly from a direct observation of its effects on the nursing child.

From the comparatively small quantity of solid or nutritive matter in the milk secreted after the commencement of pregnancy, it is evident that it is much less capable of furnishing to the nursing child a sufficient quantity of nutritive material for the healthy development of all its tissues; while the presence of granular or colostrum corpuscles, with or without infusoria, would greatly tend to establish irritation in the mucous membranes, manifested by frequent attacks of diarrhœa, more or less emaciation, and almost constant peevishness. These inferences drawn from a knowledge of the changed composition of the milk, are, to a certain extent at least, confirmed by direct clinical observations. Thus the child of Mrs. G., which was only about four months old when the mother again became pregnant, was perfectly healthy and well nourished up to that time. Soon after it began to be peevish and restless, with flatulency and occasionally green discharges from the bowels. These changes were at first slight, but they gradually increased, and at the end of six weeks it was evident that the child had ceased to be well nourished. Its tissues had become soft and flabby, and the mucous surfaces irritable, as manifested by occasional vomiting and more frequent intestinal discharges of a green color and sometimes mixed with mucus. During the succeeding two months the child was subjected to several attacks of severe watery diarrhœa, accompanied by so much emaciation, that the parents took it from the city into the country with the hope that a change of air would restore it. While absent, however, it was attacked with cholera morbus and died in two or three days. To enable the reader to judge

how far the period of primary dentition and the season of the year influenced the child, it is proper to state that at no time could I discover any evidence that the advancing teeth produced irritation, either local or general. The mother became pregnant the last week in April; and the nutrition and general health of the nursing child became decidedly impaired, before the end of the June following. This was too early for the influence of the season to be felt unfavorably; although the two following months (July and August) undoubtedly increased the tendency to intestinal irritation, and probably hastened the fatal termination. The child of Mrs. B. was also healthy and well nourished until it was five months old, when the mother again became pregnant, which was in the month of March, 1855. During the month of May, the mother applied to me for advice, saying that for three or four weeks her child had been unusually fretful and restless; that it was troubled with flatulency, often rejected its milk by vomiting, and was "getting poor." I examined the child's mouth, but found no swelling of the gums or other indications of irritation from teething. Although temporarily relieved by medicine from time to time, the child continued to fail in its nutrition and to become more and more subject to diarrhœa and vomiting, until, during the latter part of summer, it presented the appearance of extreme emaciation and anæmia. The mother persisted in nursing it until the middle of September. Soon after it was taken from the breast, it began to gain in flesh and strength, and continued to do so for two months. At the end of this time it was attacked with symptoms of subacute meningeal inflammation, and died in about six days with evident effusion of serum on the brain.

I have been thus particular in stating the health of the children, as well as the season of the year when the mothers became pregnant, in connection with the results of the analyses and microscopic examinations of the milk, that we might have all the circumstances which could be supposed to exert an influence on the results. Since their second confinement both mothers have enjoyed good health; and at the time they furnished the last specimens of milk for examination, the one in the third (see Fig. 2) the other in the fourth month of lactation, their nursing children were perfectly healthy and well nourished. Since this subject has been under investigation, I have met with four other females who had become pregnant while nursing. In all but one, the children began to exhibit symptoms of imperfect digestion and nutrition within two months from the time the mothers became pregnant, and continued to do so until they

were removed from the breast. One of these mothers came to me for advice about the propriety of *weaning* her child, in November last. She said the child had not "*grown well*, for several months;" that it was exceedingly fretful and restless, with frequent disorder of the bowels. I learned that she was then in the sixth month of pregnancy, and the secretion of milk in her breasts had been insufficient for the child without the daily use of other milk. She agreed to procure for me a vial of milk from her breasts the next day, and then immediately wean the child. To her surprise, however, she found, on making the trial next day, that she had no milk in her breasts, being able to procure the discharge of only a very few drops of a watery fluid. The child was not put again to the breasts, and no more milk was secreted until after her subsequent confinement. Here was a case, in which the progress of utero-gestation seemed to cause the entire cessation of the secretion of the mammary glands; the woman being in the mean time in robust health. The child subsequently became healthy, and remains so at the present time. On the other hand, one of the four mothers to whom I have just alluded became pregnant about the sixth month of lactation. Her nursing child continued to enjoy good health, and its nutrition to remain nearly as perfect as before. The mother herself, however, soon began to show signs of anæmia, which increased so rapidly, coupled with much nervous irritability and tenderness of the mucous lining of the mouth, that she was compelled to wean her child at the end of the fifth month after the commencement of pregnancy. So far as I have been able to observe, the effects of menstruation, both on the quality of the milk and the health of the nursing child, are much less marked than those of pregnancy. The child of Mrs. W. maintained good health, and was well nourished throughout the whole period of nursing. During the last two months, however, after the menses had returned, it became habitually more irritable, and seemed to require additional nourishment.

Investigations, such as I have entered upon, for elucidating the questions propounded to me by the Association, require much time and labor, though the results may be stated in a few words or figures. The important practical bearing of the results obtained thus far, will be obvious to every intelligent physician. But the examinations and analyses, microscopic and chemical, should be multiplied until they are sufficient to render all conclusions drawn from them demonstrated truths.

REPORT

ON THE

SANITARY POLICE OF CITIES.

By JAMES M. NEWMAN, M.D.

BUFFALO, N. Y.

REPORT ON THE SANITARY POLICE OF CITIES.

In the investigations made with a view to the preparation of the report upon the subject confided to the charge of your Committee, an examination of the materials previously collected by others, disclosed the fact, that the subject has already been pretty thoroughly treated in former reports to this Association.

The numerous able and voluminous reports made by the various committees year after year, upon the subjects of epidemics and of hygiene, have aggregated a mass of observations and facts upon all the numerous questions included in the general subject of sanitary reform, so as to leave but little else to be accomplished in the directions to be given the public in the matter of the preservation of the public health.

In the first report of the Committee on Hygiene made to the Association (*Transactions*, vol. ii.) they say: "The facts required by the Committee on Hygiene were for the most part unrecorded; books were silent on the subject; and the data which they sought to possess themselves of, were to flow from careful personal observation."

Most assuredly such cannot be said now. For if the Association has, and should accomplish nothing else, in this department of medical inquiry it has, by the collection of statistics, and the histories of the diseases of our country, with their topographical dependencies, performed a labor of inestimable value. The influence exerted by these labors is being every day more and more fully developed, in the greater attention paid to the collection of vital statistics. The profession is everywhere fully awake to the importance of the subject; and our drowsy legislators are at last beginning to realize that tables and figures may be made able to read of other facts as important as dollars and cents, and that other statistics besides those which treat of the value of lands, houses, and cattle, and of ships and merchandise, may disclose the real elements of a nation's wealth and prosperity.

In view of what has already been accomplished by previous com-

mittees, the range of subjects treated in this report will necessarily be much more circumscribed than would otherwise be proper with a subject so broad as that embraced in the consideration of "THE SANITARY POLICE OF CITIES." It will be the effort to avoid repetition, and consequently the customary considerations of cleanliness, ventilation, sewerage and paving will not be discussed except as they incidentally and necessarily spring up in the consideration of the subjects claiming attention.

This report will be an effort to tabulate the effects of disease, and to exhibit by figures the ravages that *preventable* disease is committing in our midst, and especially in our cities. The havocs of epidemics and the deductions therefrom will occupy less attention than the slow, continuous, unceasing inroads of diseases less rapid and alarming, but as certain and fatal as they are insidious. The public mind has been accustomed to view the matter of sanitary reform too much, if not alone, by the light of epidemics. They lose sight of the less violent, slower, but no less certain causes of sickness and death with which they are continuously surrounded. Death reaps a yearly harvest to the grave, and when it exceeds not the usual annual number, it is not heeded, and the inquiry is not made whether a part of his trophies might not have been snatched from him; it is only when his victims are largely in excess that public attention is arrested and alarm excited. How much permanent good is done sanitarily by the alarm excited by epidemics may admit of a question. Reformations are but seldom the results of violent assaults. The public apprehension is excited at the recital, or witness of some fearful havoc of a pestilence, alarm is felt, and a thrill of horror may pervade the community; but the effect is lost in the tendency to shelter themselves under some assurance that the circumstances surrounding them are very different from those which gave birth to the scourge.

The fact, however, of an effort being made towards the sanitary improvement of our population, whether confined in cities or living in the country, implies also an admission, or at least a belief of the existence of diseases which it is in the power of man to more or less control and modify, and to ameliorate the conditions springing from these causes. Without such a belief, of course such labors would not be undertaken, for there would be the want of those incentives so necessary to the successful accomplishment of any purposes.

As cities have oftentimes been called plague spots in morals and politics, so are they often plague spots of a verity, and the most

favorite haunts for the ravages of epidemics. The aggregation of masses seems to furnish not only the numbers necessary to satiate the rapacity of a pestilence, but the very elements out of which to eliminate the disease itself, or to furnish all the elements to nourish, develop, and perfect its growth until it has fulfilled its mission, or succumbed for a lack of victims susceptible to its attack. It is to our cities that we look for the frequent outbreak of epidemic diseases, and for their sad results. Crowds, poverty, and filth are all there, with their progeny of suffering and disease. And the philanthropist finds there always an ample field for the exercise of his broadest charities, and the most abundant employment for every labor in the behalf of his race.

Life in cities has at all times been regarded of a less average duration than in rural districts. Figures have been compiled and arranged to show the average length of life in town and country. Such presentations are most interesting, and not without the fullest instruction. They teach, too, that cities vary among themselves in their amount of mortality, and in the average duration of life among their inhabitants, and that some other cause than that of mere aggregation is necessary in the work of destruction so constantly going on in their midst; that while each develops its multitudinous sources of disease and death, the intensity of the poisons so developed differs and the fatality varies.

It is assumed by statisticians that a mortality of two per cent., or one death in every fifty individuals, may be fixed upon as a healthy and natural standard of mortality. The ratio of mortality in cities is much above this.

The following statements and figures are given to exhibit the relative proportion of deaths to the population of several of the larger cities. The contrasts thus furnished will the better enable us to judge of the loss of life resulting from causes at work within these crowded haunts of men.

In London, there dies, annually, one in every thirty-nine of the population, making the large number of 50,000 deaths yearly.

But to turn to the ravages of disease in our own country, we find the following statistics on record, declaring, with trumpet tongue, the augmented loss of life from city residence.

The following table exhibits the ratio of deaths to the population of the city of NEW YORK, extending over a period of near half a century :[1]—

[1] City Inspector's Report, N. Y., for 1853.

In 1805, a census period, the ratio of deaths to the population,							1 to 32.98.
" 1810,	"	"	"	"	"	"	1 to 46.49.
" 1815,	"	"	"	"	"	"	1 to 41.83.
" 1820,	"	"	"	"	"	"	1 to 37.19.
" 1825,	"	"	"	"	"	"	1 to 34.78.
" 1830,	"	"	"	"	"	"	1 to 38.97.
" 1835,	"	"	"	"	"	"	1 to 40.87.
" 1840,	"	"	"	"	"	"	1 to 39.74.
" 1845,	"	"	"	"	"	"	1 to 37.75.
" 1850,	"	"	"	"	"	"	1 to 33.52.
" 1853, as computed,			"	"	"	"	1 to 33.85.

The annual mortality of PHILADELPHIA, for a period of five years, was as follows :[1]—

Year.	Population.	Total Mortality.	Deaths to Population.
1851	409,000	8,871	1 to every 46.10
1852	415,000	10,258	1 " " 40.45
1853	425,000	9,744	1 " " 43.61
1854	450,000	11,784	1 " " 38.10
1855	500,000	10,458	1 " " 47.81

The deaths in BOSTON :[2]—

In 1850, was 1 to every 37.84 of the population.
" 1855, " 1 " " 39.88 " "

In PROVIDENCE, R. I, the proportionate mortality to population was :[3]—

In 1853, 1 death to every 43.20 of the population.
" 1854, 1 " " 36.67 " "

BALTIMORE.—Deaths, population, and rate per cent. of mortality for thirteen years, 1836 to 1848, inclusive. Exclusive of stillborn.[4]

Year.	Population.	Annual Mortality.	Mortality—1 to every	Per cent. of Mortality.
1836	93,919	2,192	42.75	2.33
1837	95,266	2,518	37.80	2.64
1838	97,547	2,476	39.39	2.53
1839	99,985	2,260	44.23	2.26
1840	102,513	2,045	50.12	1.99
1841	105,087	2,247	46.76	2.14
1842	108,233	2,477	43.29	2.31
1843	112,021	2,333	48.01	2.08
1844	116,501	2,665	43.71	2.28
1845	121,161	2,896	41.81	2.38
1846	127,219	2,996	42.45	2.35
1847	133,579	3,414	39.12	2.58
1848	140,457	3,861	36.19	2.76

[1] For the mortuary statistics of Philadelphia, I acknowledge myself indebted to the courtesy of Dr. Wilson Jewell, of that city.

[2] City Register's Report, Boston, 1855.

[3] Second Rhode Island Registration Report, 1853–54.

[4] Transactions American Medical Association, vol. ii. page 573.

At CHARLESTON, S. C., "from a report of the City Register, of the interments for the eighteen years, from 1828 to 1846, it appears that the annual proportionate mortality averaged 1 in 44.11; whereas, for the last eight years (1849), the average has been but 1 in 52."

In 1836, a cholera year, the mortality was 1 in 25.84.
" 1838, a yellow fever year, the mortality was 1 in 25.05.
" 1839, " " " 1 in 35.38.

Since then, by the sanitary improvement of the city, for a period of eight years previous to 1849, the standard of mortality has been raised to 1 in 52.[1]

At CHICAGO, the comparative mortality for five years was as follows:[2]—

Year.	Population.	Annual mortality.	Mortality—1 in every	Mortality per cent.
1846	14,169	327	43.33	2.30
1847	16,859	487	34.61	2.88
1848	19,724	514	38.37	2.60
[3]1849	23,047	1,223	18.84	5.30
1850	28,620	1,334	21.45	4.66

In NEW ORLEANS, the proportionate mortality, extending over a period of nine years, is as follows:[4]—

Year.	Population.	Mortality.	Deaths to population.
1846	102,070	4,220	1 in every 24.18
1847	108,699	9,043	1 " 12.02
1848	115,503	8,026	1 " 14.39
1849	122,511	9,862	1 " 12.42
1850	129,747	7,819	1 " 16.59
1851	138,599	7,275	1 " 19.05
1852	147,441	8,670	1 " 17.00
1853	154,132	15,787	1 " 10.39
1854	160,823	10,564	1 " 15.22

Proof is found in the foregoing statistics of the greatly augmented loss of human life, consequent upon causes at work within our thickly settled cities. A sort of sliding scale will be noticed in the range of this increased mortality from year to year, even within the

[1] Transactions Amer. Med. Assoc., vol. ii. p. 579.

[2] Ibid., vol. iv. p. 545.

[3] In 1849, 681 deaths were by cholera; and in 1850, 473 deaths were by the same disease.

[4] Barton's Report of the Sanitary Commission of New Orleans. Calculated from Chart A, and "Comparative Tables," p. 461.

same city; and at the same time from the favorable character of location, or from a more strict observance of hygienic laws, that a marked advantage is enjoyed by one town over another in a decreased rate of mortality. But the most highly favored still falls below the healthy average. The elevation of the ratio of mortality to its normal standard anywhere and at any time is a very rare and exceptional occurrence, so seldom as to elicit surprise, and almost suggest doubts of the accuracy of the figures.

If this augmented loss be beyond control and remedy, it is the penalty we pay for our civic enjoyments. If it be controllable by human means, and we leave those means unemployed, the loss is suicidal, and responsibility somewhere attaches.

This waste of life is strongly set forth in the following curious calculations made in reference to London. This metropolis contains about 2,000,000 inhabitants, or about one-eighth of the population of England and Wales. Of this number, according to the Registrar General, more than 50,000, or 1 in 39, die annually.

"But if the rate of mortality were 1 in 50, in place of 1 in 39, as it is in several large towns of England, and in the healthier parts of the metropolis itself, there would be an annual saving of 10,278 lives. In the metropolis there are about 266 deaths every week, nearly 38 deaths a day, or considerably more than one every hour, *over and above* what ought to happen in the common course of nature. Now, it has been calculated that for every death which takes place, there are 28 cases of sickness which do not end fatally. We have, therefore, 387,296 cases of sickness occurring in the metropolis every year which are unnecessary and preventable: 13,832 lives could be saved—more than a third of a million of cases could be prevented."[1]

In our search after the peculiar agencies manifesting themselves with such severity upon our urban populations, and so markedly abridging their span of life, we are almost intuitively led to fasten upon those diseases which are known to be developed by the malign influences resulting from the habits and modes of life to which they are exposed. To those diseases which are propagated from one to the other, or which are engendered by filth, or vitiated air, or both combined, and we encounter that class known by nosologists as *Zymotics*, and which are infectious, or contagious in their character.

[1] Journal of Public Health, vol. ii. p. 225.

Zymotics have been broadly defined as those diseases "which are propagated by emanations, from the ground, from decaying animal or vegetable matter, from cases of previous disease, or from over-crowded human beings, diseases which are, or may be epidemic, endemic, or contagious."[1]

The amount of mortality from this class of diseases, and the proportion borne by them to the entire mortality, are such as to arrest attention, and demand from us more than a passing remark.

The total number of deaths in the United States for the year ending June 1st, 1850, was 323,023. Of which 131,813, or 40.80607 per cent. were zymotics.[2]

If we deduct from the above 31,506 deaths caused by cholera, we have by causes ordinarily in operation 291,517 deaths, and 100,307 deaths, or 34.4086 per cent., or over one-third produced by zymotics.

In MASSACHUSETTS, for thirteen years and eight months, 29.05 per cent. of all diseases from specified causes were from zymotics.[3]

In RHODE ISLAND, from June to December, 1853, 33.194 per cent., and for the year 1854, 37.193 per cent. were produced by the same causes.[4]

In NEW YORK CITY, the deaths resulting from zymotics were in the proportion—

In year	1852	of 30.29	per cent.
" "	1853	" 25.93[5]	"
" "	1854	" 35.35[6]	"

In BOSTON and LOWELL they bear the following proportionate rate of mortality:—

	Years 1836 to 1840.	1841 to 1845.	1846 to 1848.
In Boston,	26.51 per cent. of all deaths.	28.36 per cent.	29.96 per cent.
" Lowell,	37.94 " "	35.47 "	48.83 "

In BUFFALO,[7] the deaths and proportional mortality were:—

	Total deaths.	By zymotics.	Per cent.
In 1854	2,936	1,321	44.99
" 1855	1,856	559	30.11

[1] Second Registration Report of Rhode Island, p. 69.

[2] Mortality Statistics of the Census of 1850 of the United States.—By J. D. B. De Bow.

[3] Thirteenth Registration Report, p. 158.

[4] Second Registration Report, Rhode Island, p. 44.

[5] Annual Report of City Inspector, N. Y., for 1853, p. 226.

[6] Annual Report of City Inspector, N. Y., for 1854, p. 232.

[7] Transactions American Medical Association, vol. ii. p. 504.

In BALTIMORE, for thirteen years (1836–1848), the proportionate mortality caused by zymotics was 28.627 per cent. of the whole number of deaths reported, exclusive of stillborn.

The yearly rates for the above period are thus exhibited:[1]—

Year.	Zymotics.	Year.	Zymotics.
1836	25.228 per cent.	1843	23.703 per cent.
1837	30.619 "	1844	30.206 "
1838	26.817 "	1845	31.284 "
1839	26.548 "	1846	29.205 "
1840	20.733 "	1847	31.868 "
1841	24.032 "	1848	34.939 "
1842	28.825 "		

In PHILADELPHIA, for the last quinquennial period, the proportion borne by zymotics to the sum total of the mortality, was as follows:[2]—

Year.	Total mortality.	By zymotics.	Per cent. of zymotics.
1851	8,871	2,213	24.94
1852	10,258	2,785	27.14
1853	9,744	2,422	24.85
1854	11,784	3,306	28.05
1855	10,458	2,460	23.52

Table exhibiting the Comparative Mortality of Zymotics in the several States of the Union, for the year ending June 1, 1850. Calculated from De Bow's "Mortality Statistics of the Census of 1850.

States and territories.	Deaths from all causes.	From zymotic diseases.	Per ct. zymotics.	States and territories.	Deaths from all causes.	From zymotic diseases.	Per ct. zymotics.
Alabama . . .	9,091	3,029	33.31	Missouri . . .	12,292	6,832	55.58
Arkansas . .	3,021	1,358	44.95	New Hampshire	4,231	1,582	37.39
California . .	905	659	72.81	New Jersey . .	6,465	2,512	38.85
Columbia, Dist. of	846	289	34.16	New York . .	45,600	17,976	39.42
Connecticut . .	5,781	1,987	34.37	North Carolina .	10,165	2,495	24.54
Delaware . . .	1,209	461	38.13	Ohio	28,957	16,138	55.73
Florida . . .	931	307	32.98	Pennsylvania .	28,551	11,645	40.78
Georgia . . .	9,925	3,136	31.59	Rhode Island .	2,241	780	34.80
Illinois . . .	11,759	5,858	49.81	South Carolina .	8,047	2,645	32.86
Indiana . . .	12,708	6,331	49.81	Tennessee . .	11,875	4,524	38.09
Iowa	2,044	954	46.67	Texas	3,057	1,285	42.03
Kentucky . .	15,033	6,895	45.86	Vermont . . .	3,129	951	30.39
Louisiana . .	11,956	5,999	50.17	Virginia . . .	19,059	5,190	27.23
Maine	7,584	2,654	34.99	Wisconsin . .	2,903	1,242	42.78
Maryland . .	9,621	3,345	34.76	Minnesota . .	29	12	41.37
Massachusetts .	19,404	7,189	37.04	New Mexico . .	1,157	335	28.96
Michigan . . .	4,515	1,428	31.62	Oregon . . .	47	23	48.93
Mississippi . .	8,721	3,689	41.72	Utah	239	149	62.34

[1] The ratios of Baltimore are calculated from Dr. James Wynne's "Sanitary Report of Baltimore," vol. ii. Trans. Am. Med. Association.

[2] Dr. Wilson Jewell.

We shall find a confirmation in the foregoing figures of the remark frequently made, that the best index to public health may be deduced from the proportion in which these diseases prevail. It is the property of zymotic diseases to prevail more at one season than another; or more in one locality than another; and to become epidemic, endemic, or contagious under certain circumstances.

It is admitted that these diseases, so fatal among us, are those most amenable to hygienic laws. As will a residence without the circle of their influence secure an immunity from attack, so would an entire removal of the causes of their development, of course insure their extirpation. An exemption of the race from the evils of their presence would be procured by the eradication of the elements of these morbid actions.

Upon the power of human agencies to control, limit and prevent those combinations which give birth to, and insure the full development of these diseased actions, hinges, therefore, the whole question of the utility of the labors in the behalf of sanitary reform.

In the class zymotics are grouped, in conformity with the nosological nomenclature adopted by this Association, and now most generally employed in recording American mortuary statistics, sixteen distinct forms of disease, viz: cholera, cholera infantum, croup, diarrhœa, dysentery, erysipelas, intermittent fever, remittent fever, typhus fever, hooping-cough, influenza, measles, scarlatina, smallpox, syphilis, and thrush.

Several subdivisions are employed in most of the State and city mortuary reports for the purposes of more distinctly marking the ravages of some phase of disease, and imparting to them an enhanced local value. We consequently find the above list extended by the additions of cholera morbus, typhoid, ship and yellow fevers.

A separate examination of the prevalence and fatality of several of the most destructive of the diseases embraced in the above classification, will afford us an opportunity to enter into the discussion of the sanitary questions involved in their eradication, and will bring before us those subjects more pertinently applicable to the subject of inquiry intrusted to the Committee.

Upon the very threshold of our subject we are compelled to bow before the hidden mysteries of the causations of disease, and confess the poverty of our knowledge, and the imbecility of our strength.

The investigations of science have yet revealed nothing which enables us to discover the peculiar elements concerned in the pro-

duction of six of the diseases belonging to the class under consideration. Of the etiology of croup, erysipelas, hooping-cough, influenza, measles, scarlatina, we are profoundly ignorant. All we know of them is, that while they perhaps are never absent entirely, they at times assume in the widely spread circle of their influence, and in the intensity of their action, every characteristic of the severest and most fatal epidemics. Four of them are undoubtedly contagious. Three of them secure the system against a repetition of attack. Four of them are pre-eminently diseases of early childhood, and are among the most active agencies in the production of the terrible mortality of infantile life.

The elements concerned in their development seem to be meteorological rather than terrene, depending upon some peculiar atmospheric conditions of which we are yet unable to take cognizance. City life seems to have but little influence in adding to their severity, and the sum total of their mortality is increased only by the greater number exposed. They extend to the remotest bounds of the country, and penetrate the most secluded hamlet with a severity as great, and a tendency as fatal as when developed in a crowded city.

We only know that inasmuch as measles, scarlatina, and hooping-cough are propagated by contagion, that, as a sanitary measure, a removal beyond the sphere of infection would for the time being secure an exemption from attack; but the extreme susceptibility of childhood to the specific contagion of these diseases, renders such a measure of but little avail except in securing a short truce to the attack, since it seems to be almost a law of its nature that it should suffer once an attack of these diseases. Croup and influenza leave us to look to atmospheric changes too occult for us to demonstrate their character, or from whence they emanate.

With the balance of the diseases in our class scientific investigation has grappled, and endeavored to pierce the mysteries which surround them. But even with them, our boastings should be tempered with the greatest humility, as we have too often occasion to discover that our strength is but weakness, and that we can as yet penetrate but a very short distance within the veil which conceals the mysteries of epidemics and endemics from our view.

The first disease in the alphabetical arrangement of our class is CHOLERA, a disease, as it were, of our own day, with whose birth, progress, and fearful march over the face of our globe we are all personally cognizant. Twice has it come up from the land of its birth

and overrun empires and states like a fierce army, and the sound of the footsteps of the last march has not yet died on the ear, and we have no assurance that the invader has yet entirely withdrawn from our shores, or that he may not again return to devastate our towns and cities.

It is not our purpose to enter into discussion upon any of the innumerable theories which have been proposed as to the specific causation of the disease. While the fact is admitted of its epidemic character, and of its having as its remote cause some specific source of infection, which finds means of dissemination in the atmosphere, experience and observation go far to prove, if they do not render the proof certain, that terrene agencies enter largely into the causes which give the necessary intensity to the poison to develop it into action. The nicely poised balance existing between these two elements, the meteorological and terrene, whose equilibrium, when disturbed ever so slightly, is productive of such deplorable results, is the problem now occupying the attention of the meteorologist and the sanitarian.

Cholera is emphatically an epidemic of cities. It hovers about the haunts of men, and riots in the crowd. It dwells with the denizens of the city, and follows them on the travelled highway, and along the frequented watercourse. It lurks in the camp, and marches with the army. It is where man is found in masses, and living under circumstances which in any manner will serve to develop the germ of the disease from a latent to an active state, that we read of the ravages of this pestilence.

Its proclivity for an urban population, and its exemption of the dwellers in the country so constant as to scarce make an exception, points very strongly and forcibly to the hypothesis that with the former are found elements of some character necessary to a full development of the seeds of the disease, be they produced, or borne from what source they may. The pestilence has, too, its favorite haunts even within the town. In the crowded lane, and the filthy, over-populated street, reeking with foul emanations from the soil or neglected pavements, mingled with emanations as foul from the persons of the careless, negligent crowds, the disease reigns in savage triumph, and sways the sceptre of death over the devoted indwellers.

In fact, the discussion of the causations of cholera in their terrene dependencies opens the whole of the oft-repeated stories of the influences which the violations of the most palpable hygienic laws

have upon the development and spread of this epidemic, and I confess that there is no little difficulty in any presentation at this day of these agencies, which will not necessarily involve the repetion of these thrice-told tales.

It is too true, however, that these generally accepted facts are not productive of those results which we would naturally look for as the sequence of truths so readily admitted as to seem to render argument in their behalf unnecessary. It is true that the outburst of the epidemic, or an anticipation of it, will lead to a spasmodic effort at cleanliness, but the spirit of vigilance thus engendered dies too often with the causes which called it forth. There is an absence of a continuous, systematic course of remedial measures calculated to remove at all times the fruitful soil in which the pestilence finds root, and develops itself into a full harvest. A recognition so general as it has become of the influences exerted by the violation of sanitary laws in the development of cholera, and that it is chiefly among those exposed to such contaminations that the disease finds its chief victims, has undoubtedly done much to disarm the epidemic of the terror with which it was once regarded; but this very fact is suggestive of the inquiry, whether it has not begot a false security in the public mind, and may, if it has not already done so, produce an indifference to the ravages it causes. Admit the fact that it pervades the lanes and alleys where poverty and misery hide, that it reigns in the hovel of the intemperate, and makes its home in the abodes of the poor and miserable, and the process is short to connect the causes and the sufferers together, and to argue that they are inseparable, and forgetting the humanity which dwells in the sons and daughters of poverty and misfortune, leave them to their fate, without an effort to alleviate their condition. The not unfrequent outbreaks of the epidemic in districts where, from a casual inspection, we should not look for its advent, however, serves to remind us that the flame which has been lighted in a hovel may spread a conflagration even to the palace. We should remember that the circle of its influence may radiate far from the centre of its birth.

The deaths by cholera in the United States, for the year ending June 1, 1850, and which nearly if not quite covers the epidemic period of its second visitation to our shores in 1849, were 31,506, as returned by the census report of that year. As large as is this aggregate, it is *exceeded* by the sum of the other forms of disease of the alimentary passages.

We gather, from the same source, that during the same period there were from

Cholera infantum	3,960	deaths.
Cholera morbus	1,568	"
Diarrhœa	6,366	"
Dysentery	20,556	"
Thrush	424	"
	32,874	"
Add by cholera	31,506	"
	64,380	"

And it is seen we have a total of 64,380 deaths from diseases of the alimentary passages, being 19.93 per cent. of all the deaths reported for the year.

The prevalence of cholera is well known to add largely to the frequency, and consequently to the mortality of the other diseases of the intestinal canal, and we accordingly find a very large increase from diarrhœa and dysentery. This increase is not only in the immediate circle of the cholera influence, but far beyond it, where the cholera poison seems to have not sufficient intensity to develop itself into this specific form of disease, but is modified into some other variety of intestinal disease. Perhaps, within a cholera district dysentery may be regarded rather as one of the sequelæ of the cholera influence, as one declines the other develops itself, and under such circumstances the severity of the disease and its tendency to a fatal termination is but a little less than cholera itself.

The intimate connection between the causations of cholera and these other forms of disease is not only distinctly marked by the parallelism between the extent to which they prevail, and that diarrhœa is also the uniform precursor, or first stage of cholera, but that precisely the same circumstances by which and under which cholera is developed, are those which develop diarrhœa and dysentery. The same sanitary characteristics of locality may develop one or all of the several forms of disease, being controlled alone by individual susceptibility; or a difference in the moral and physical condition of the parties may so far act as a modifying influence as to cause the substitution of one disease for the other.

FEVER, in its varied forms, is also one of the mighty agents in the constant destruction of life witnessed on every side. Too little care, as a general thing, is paid to accuracy of type in diagnosis to insure uniform correctness of classification, and no doubt the name

of one form of the disease is frequently substituted for that of another, and there cannot consequently be that minuteness of detail arrived at, desirable to assign to each distinct type its true percentage of mortality. But enough can be learned to prove the destruction annually caused by the diseases bearing the general names of fevers.

In the "Mortality Statistics of the Census of 1850," we find the number of deaths caused by fever in its various forms, for the year ending June 1, 1850, returned as follows:—

Fever,	18,108
Fever, Intermittent	964
Fever, Remittent	148
Fever, Ship	240
Fever, Typhoid	13,099
Fever, Yellow	785
Total number of deaths by fever	33,344

It will be seen that the number of deaths by fever was greater than those by cholera, during the same year in which the latter raged as an epidemic. It is perhaps not too much to say with these figures before us, that we had two epidemics abroad through the country, doing the work of death side by side. One was spreading consternation and alarm wherever it appeared; the other was silently, unnoticed, and unheeded, but just as certainly, filling the grave as the dreaded cholera.

It is to be regretted that the above classification is not sufficiently specific in the characteristics of the different types of the disease so that each might have exhibited its due proportion in the scale of mortality.

Fever stands prominently forth as one of the zymotics, and perhaps that term alone is the only one sufficiently comprehensive to embrace the conflicting views of the etiology of the various forms of fever. Without stopping to argue any of the theories of contagion, infection, or portability, it is sufficient for our purpose, to raise the inquiry and to arrive at the fact if possible, how far any of the exciting or predisposing causes of fever in any of its forms may be dependent upon and controllable by human agencies.

The fevers of our cities developed apparently in consequence of the violation of sanitary laws, assume generally the distinctive forms of typhus, typhoid, and yellow fevers. But like cholera, closely compact masses anywhere gathered together, and living under circumstances grossly in violation of the laws of health, are

liable to and may at any time develop these forms of disease. We accordingly almost daily hear of the outbreak of fever in some of its forms, upon shipboard, within our jails and almshouses, and in the camp. As we trace it within cities, we find it developed under circumstances very similar to those which give birth to cholera, or which when united to the specific cause of that disease give it such a fearful potency.

Typhus fever is especially rife in the densely populated portions of towns. We have here all the causes most favorable to the development of disease—numbers and the concomitants inseparable from dense crowds, filth, and contaminated air. The effects of density of population in the production of the disease has been made a subject of investigation in London, and the following facts arrived at.

"The effect of crowding is shown by a table exhibiting the mortality, and the number of square yards of space to each person in three groups of metropolitan districts.

	Square yards to each person.	Annual Mortality.	Mortality from Typhus alone.
1st group of ten districts . . .	35	3428	349
2d " " . . .	119	2786	181
3d " " . . .	180	2289	131

"Hence we perceive that typhus is nearly three times as fatal in the first or crowded group as in the third or open one."[1]

In a report upon Public Hygiene, made to this Association by Dr. Joseph M. Smith, in 1850,[2] the subject of the sources of typhus fever was made the theme of the paper. The design was "to show that the disease originates from human excretions." The report is valuable in exhibiting forcibly the sources of contamination existing within the human body, and the mass of effete matters thrown off by the numerous emunctories daily.

Dr. Smith claims, that it is to the excrementitious matters thrown off from the lungs and skin that the poison of typhus is mostly traceable. He assumes as a basis of calculations, that the quantity of pulmonary and cutaneous excretions is 40 oz. daily, and that of this amount 10 dwt. consist of organic or animal matter, and upon these data enters into a number of curious calculations of the amount of effete matters thus thrown off in crowded jails, ships, camps, and badly ventilated houses.

[1] Chambers's Information for the People, vol. ii. p. 551.

[2] Trans. Amer. Med. Assoc., vol. iii.

We make the following extracts from the report: "Let us suppose a family, one, of which there are hundreds of examples, consisting of ten adult persons, dwelling in a small, ill-ventilated house, and negligent of personal and domestic cleanliness; and further, that the time severally passed within doors by the ten individuals, some of whom are constantly at home, while others are temporarily absent, amounts in the aggregate to twelve hours out of every twenty-four. The mass of effete matters thrown out by the lungs and skin, by such a family within their dwelling in one month is 500 lbs., in six months 3033 lbs. 4 oz., and in one year 6083 lbs. 4 oz.[1] Though by far the greater part of these excretions consist of carbonic acid, water, and salts, yet the *quantity of ejected animal matter* is not inconsiderable. It amounts in one month to 6 lbs. 3 oz.; in six months to 37 lbs. 11 oz.; and in one year to 76 lbs. 0 oz. 10 dwt. In such circumstances it is, and especially in seasons in which the prevalence of typhus is favored by an epidemic influence, that the disease often spontaneously originates in the squalid homes of the poor."

These calculations have been extended so as to embrace an entire city, from which we make the following quotation:—

"The inhabitants of a densely populated town may be regarded as a single family, living in contiguous or narrowly separated apartments, any number or the whole of which may as certainly be rendered infectious by overcrowding, as the cells of a prison. In no mode perhaps can the danger from this source of disease be so distinctly impressed on the mind as by estimating the quantity of waste matters eliminated from the bodies of the people of a city in given times. If we assume as a numeral basis a population equal to 200,000 adults, it will be found, if calculated as in former examples, that the entire pulmonary and cutaneous egesta amount in one month to 20,000,000 lbs.; in six months to 121,333,333 lbs. 4 oz.; and in one year to 243,333,333 lbs. 4 oz.; and that the *exhaled animal matter alone* amounts in the first of these periods to 250,000 lbs.; in the second to 1,516,666 lbs. 8 oz.; and in the third to 3,041,666 lbs. 8 oz.

"The health of a city depends in no small degree upon the distribution of the inhabitants over an area of sufficient extent to admit of the free ventilation of every dwelling. When such a distribution obtains, and attention is given to personal and domestic clean-

[1] A month is reckoned as 30 days; six months as 182 days; and one year as 365 days.

liness, a population of 200,000 or any greater number, will be as secure against the invasion of typhus as are the inmates of a commodious, cleanly, and well-aired private dwelling. But populate a town as densely as are the alleys and courts of many cities, and the consequence will be that the whole population will feel the influence of an *idio-miasmatic* atmosphere, and disease be co-extensively produced."

It will be observed that the urinary and fecal excretions are not taken into the account as a source of contamination. These doubtless should not be lost sight of entirely as a means of adding to the impurities and seeds of disease otherwise engendered by crowds, for although generally removed from the dwelling, it is only that they may become festering pestilential pits poisoning the atmosphere and those who breathe it. After making all due allowances for errors almost inseparable from such calculations as have been quoted, I think we all will be willing to admit that Dr. Smith has proved that man may become a very dirty animal, and that we shall be ready most fervently to exclaim, "that cleanliness is next to Godliness."

YELLOW FEVER is also developed under circumstances similar to those which give rise to the several forms of disease we have been considering, but seems to require a much more elevated temperature for the emanation of the poison.

Decaying matters, vegetable or animal, filth of all kinds, exposed to an intense heat, such as is experienced under a southern sun, united to moisture, seem at least to furnish the pabulum for the development of the disease. I shall not stop to inquire whether the disease is ever, under these circumstances, generated *de novo;* or whether it always requires the presence of a specific cause for the production of the disease.

The recent labors of Barton and La Roche, directed toward the development of the etiology of yellow fever, leave but little at present to be added to the literature of the disease; and experience and observation alone, it would seem, must hereafter add to our knowledge of the disease.

We now approach the consideration of those municipal regulations which have for their object the correction of the evils which originate and propagate disease, or are in any ways inimical to the public health. With the masses in our cities, dependence upon

the influence of personal appeals, or a reliance upon simple individual labor, will be ineffectual for the eradication of these evils. Enlightened individual labor, it is true, can accomplish much; but, not to stop to take into consideration the fact that very many are so indifferent to the interests of their neighbors, that provided their own ends are attained, they are heedless of the jeopardy in which the health and lives of others may be placed; the larger part of the work to be performed is too great for personal effort. Concentrated action, backed by *law* and the *public purse*, can alone accomplish the greater part of the labor to be performed.

The regulations of a city which look to the preservation of the health of the citizens are among the most important of all its municipal laws. The defect has always been in the poverty of such existing laws, and the laxity and indifference with which these, feeble as they have been, have been executed. Our health laws would seem, too often, to have had a place upon the statute books simply as a species of solace to the public, and as if in obedience to a sort of a half formed conception that something of the kind was necessary. But they have too generally been permitted to lie hidden from sight, and only been brought to light when some fearful calamity has fallen upon the community, and they have been aroused from their indifference, to make an exertion to correct the evils by which they are surrounded.

Many of the evils from which our communities suffer have their origin deeper than can be reached simply by the broom and shovel, and corrected by the removal of a little filth from the surface of the street, or from the corner of some yard or vacant lot. Many of the evils have their roots in the social and moral position and condition of the citizens. To them they are chained by the force of circumstances, which they cannot control; poverty often binds and confines them within the poisoned circle, and unless relieved by the charities of the public exerted in their behalf, must forever so remain.

All these matters legitimately come under the cognizance of an intelligent and liberal police, directed towards the sanitary improvement of the public health. In the exercise of such authority and supervision, not only the removal of such existing evils as experience has proven to be injurious should be the labor performed, but every effort should be directed to the prevention of the development of these evils. Prevention as well as cure, and

prevention rather than cure, should be the end most earnestly sought after.

Some of the sources of the malign influences existing within our cities, to the prejudice of the health of the indwellers, and resulting in disease and death, will claim our attention. Although necessarily compelled to be brief, we shall give as full consideration as possible to the influences exerted upon the public health by water, sewerage, paving, over-crowded and ill-ventilated houses, the removal of the soil, and such other subjects connected with matters under consideration as may present themselves during the discussion.

WATER is among the chief of man's every day's want, and to the dwellers within city walls it is among their greatest necessaries. But pure water, to the great mass, is among the luxuries scarcely attainable. I think I hazard nothing in saying, that in every city in our country the supply of pure water is entirely inadequate to the wants of the inhabitants; that, to a very large portion of the dwellers of every city, the supply is not only in many instances impure, but entirely inadequate to purposes of domestic and personal use, so as to secure by free application, cleanliness and health. I make this remark, in full view of the numerous corner wells and pumps that grace the waysides, and the lordly reservoirs which are the glories of several of our cities. But the presence of these does not invalidate the statement. They furnish to the wealthy a full supply; but to them only at the price and cost of a luxury; but what city is without its streets and districts of inhabitants to whom their supply is most scanty, and where they are driven to seek for the water they daily use, to some filthy canal or creek, rich in the seeds of disease?

The sources of a city's supply of water are among the most interesting subjects which can present themselves to the consideration of the inhabitants, and is it not true that the matter never receives attention until by the force of circumstances the consideration can no longer be deferred?

A reliance upon wells, which until quite recently has been the chief source, is at best uncertain, and must eventually, in cities, be abandoned, in consequence of the contaminations of the soil inevitable upon causes constantly at work therein. The earth must, earlier or later, depending upon population, become saturated with filth. The contaminations of privies and sewers, and the leakage

of gas-pipes, must sooner or later render every city well a receptacle only for filthy water. A very little exercise of the imagination will suggest how impossible it is to have, or to expect pure water with the close proximity there exists between our wells and the sources of contamination alluded to. The well, sesspool, and privy frequently stand but a few feet apart, and the sewers beneath the streets are abundantly capable of discharging more or less of their contents in addition into the source from whence we derive one of the essentials of life.

Where these sources of pollution do not exist to such a degree as to be a serious difficulty, it is not at all times practicable to obtain water fit for use. Almost every locality furnishes abundant examples of impure waters, dependent upon some peculiarity of soil or rock. Many wells, in consequence of some geological peculiarity, are very evidently nothing more than receptacles for surface water, which has percolated without filtering through fissures in the earth or rock. This difficulty exists especially in a clay formation. Clay is almost as impervious to water as the rock, and where a sufficient superstratum of sand does not exist so as to furnish a filter for the water as it descends from the surface, a well excavated in the dense "hard pan" merely serves to collect the fluid as it descends through and along the crevices which everywhere pervade its substance.

Every city must from necessity look to some source from without the boundaries of infection for a supply of this essential of life, and the earlier it recognizes the fact, and enters upon some provision for a compliance with this inexorable law, the better will it be for the welfare of its population. Health will be preserved and life saved.

The introduction of water from without a city by artificial means of any kind, involves a large expenditure of capital, and consequently the time and manner of supply has been most generally left to private enterprise, the governing question in the undertaking being—"Will it pay, and how much?" So long as the matter of supplying our towns with water is left in the hands of companies, or individuals, just so long will the evils resulting from an insufficient supply of this element be only partially remedied; the sources of disease and the class of persons most in need will never be reached.

In the public park, the fountain may leap joyously upward and flash and sparkle in the sun as if its every drop were a jewel; and

in the houses of the wealthy, water may flow in profusion, and beautify and adorn their grounds, and dispense to them all its blessings; but to the great sources of want and disease it will never flow to wash away the festering impurities. A water company runs its pipes only into those streets which will pay; the poor cannot pay, and no stream flows to gladden their sight, to allay their thirst, or bathe their bodies. Every drop that flows has its price, and as it falls is watched with as jealous an eye as if it were expected that it would congeal into a diamond.

Nor have we any right to charge upon them an excess of cupidity. The only incentive they had for the outlay of their capital in such an enterprise, was the prospect of profit. It is true, they saw and recognized the wants of the public, and out of this necessity sprang the means of a profitable investment of their money; but they have only taken advantage of the market and are selling their wares at the highest price possible, with, however, this powerful advantage in their favor, that they generally have the monopoly of the market, and can use their advantage with cruel power if so disposed.

The great error is, in municipal corporations permitting such a power being vested in individuals or companies. Water is next to air in importance, and they as the legal representatives of *the public*, should reserve to themselves this monopoly, and make the most ample provisions for the supply of every inhabitant, rich and poor, within the boundaries of their government. This principle should be recognized, and no town or city should hereafter permit this right to pass from their control; and every municipal corporation, where this right is already vested in some other party, should seek the earliest opportunity for resuming the same, and becoming, as they rightfully should, the means of dispensing health and happiness among the citizens, without the debasing question of profit entering into every consideration. And then as a sanitary measure, reverse the ordinary course of things, and let the pipes be laid and the water carried first, to the narrow streets and lanes, and to the abodes of the poor. Let the supply be abundant for their every necessary want. If you do not put water in every house, and it is not necessary you should, place it near to the hand of every person. Let the possibility of a wasteful use of it, be a question of secondary importance. Furnish them with the means of cleanliness and health, and then seek the broad avenues and the habitations of the wealthy.

Let the rich remember while they are waiting until their poorer neighbors are served, that their own safety is insured thereby; for while disease, as has been shown, is engendered among the abodes of the poor, the poison may distil over and invade the homes where every comfort that money can purchase is found. If no considerations in behalf of the sufferings of a common humanity are sufficient to dictate a course pointed out so plainly, let the question of personal interest and safety be presented and govern. Let them be humane and just out of pure selfishness, if no higher motive can actuate them.

PURE AIR is another of the essentials of health. As considered in its sanitary relations, it is generally discussed under the head of *Ventilation*. This subject has of late attracted much attention, and its importance is becoming more and more generally recognized. In practice, however, the application of the principles of ventilation is most defective. In our better class of dwellings some attempt is made towards this end; and in our public buildings a show of insuring a change of air for the benefit of the inmates is made; but in both classes of buildings, the results obtained fall far short of the objects sought. The true principles of ventilation are yet but imperfectly understood by the community, and the greater portion of the modes employed are defective, and serve more to amuse than to answer the purposes for which they were really designed. As the attention of the better informed classes of the community is directed to this subject, and as it has become *fashionable* to erect buildings with ventilators and other apparatus for insuring a current of air through the same, it is to be presumed that the evils, so far as they are concerned, will before long be remedied, and we shall not, therefore, devote time to their consideration.

We shall give more particular attention to those dwellings where the influences of fashion and the lights of science do not penetrate, to those habitations where the seeds of disease and death are produced and imbibed by the inhabitants with every breath. We shall not stop to enter into any argument to prove how much breathing space every human being needs; the quantity of oxygen destroyed at each inspiration; or the number of cubic feet necessary to every apartment. We shall assume, as beyond a question, that a *sufficient* supply of pure air is necessary to every human being to insure the highest health; and we shall also assume, as a

fact beyond dispute, that in every town in our land are found buildings which do not furnish these requisites of perfect health.

In every town (the larger it is, of course the more aggravated are the evils likely to be) are to be found habitations overrunning with inmates, apartments filled beyond all limit to their capacity, rooms in which more than one family not unfrequently are found herding together in violation of every law of decency as well as of health; narrow, filthy streets and lanes crowded with high buildings, confined courts, into which the sun never penetrates and the air never circulates, and where dense multitudes live, and breathe continuously an air of pollution, and die a death of slow poison. These facts are too notorious to require at this time the citation of specific examples to prove the assertion. Every sanitary report made to this Association contains abundant proof of the truth of the statement. Our object is simply to point out the manner in which this gross evil and wrong upon society, and the poverty-stricken especially, is to be corrected.

Our suggestion as the means of the sanitary improvement of this condition of things, is found in the single sentence—*that the evils are to be corrected, and to be corrected alone by the strong arm of the law.*

The ignorance of some, and the cupidity of others, will render any other measure ineffectual in correcting the pestilential sources of misery in our midst. Just so long as there are those whose poverty compels them to accept the miserable accommodations to be found in these wretched abodes, so long will there be found those to take advantage of their necessities, and coin money from the sufferings of the poison-breathing inmates. The ingenuity of property holders in those localities where the poor most do congregate, seems taxed to the utmost to crowd the greatest number of human beings into the smallest possible space. Every additional tenant pays full tribute to their purse, and what matters it, if health, decency, and morality, all be corrupted and destroyed, if the poisoned heart's blood is turned into gold to add to their wealth. What wonder is it that such abodes become the home of the pestilence, and that, as if in revenge for their wrongs and sufferings, the plague should propagate itself far and wide throughout the boundaries of the town?

We want a strong municipal law, which shall plainly and distinctly say in what manner our edifices shall be built, especially those which are to be situated under circumstances likely to develop disease, and to be inhabited by those whose pecuniary circumstances

and personal habits are liable to induce conditions from which may arise sources of contamination; a law which will prescribe the number of inmates to a building and to a room; a law which will define and give to each man, woman, and child, a sufficiency of air and breathing space.

To the objection that may be made, that this would be an encroachment upon individual rights, and would interfere with the interests of property holders, and subject them to expenses and untoward hardships, I would reply, that society has assumed to itself this right in other matters; that it has assumed to itself the right of protecting itself against the dangers and risks of conflagrations; that it defines the mode in which our buildings shall be built so as not to hazard the property of others; that it does this at the risk of an increased expenditure to the builder, and a diminution of his profits, nor pays heed to any cry of hardship which may be raised, as it legislates for the safety of the public at large; so, we contend, that the power which defines that our edifices shall be built fire-proof, is equally potential to declare and insist that they shall be built *disease proof*. Law now defines the number of passengers a vessel may carry upon the seas, and sacrifices the profits of the merchant to the safety and welfare of the passenger.

We have an approach to such a law in the authority which is vested in our Boards of Health, to enter in times of epidemics, and thin out an overpopulated house. But, as prevention is better than cure, the evil should be prevented, not simply corrected. No opportunity for the development of disease should be given. After the poison is imbibed, you probably will arrive too late with your prophylactics and antidotes, and death will do its work.

Under the present order of things, a tax is just as effectually laid upon pure air, and its free use prohibited by the narrow, pent-up apartments, ill-supplied with doors and windows as are most generally the dwellings of the poor, as if a tax collector called daily upon the inmates for the price of what they consumed. Air and water are both made a luxury, and sold them at the highest possible price. Epidemics alone do not make their homes in such abodes, but scrofula wastes and deforms and destroys the form of childhood, and gaunt consumption eats out the life of full grown men and women, and death in every form is the companion of the wretched inmates.[1]

[1] See Appendix.

SEWERAGE AND PAVING are undoubtedly among the efficient means of adding to the health of a town. Sewers, if properly constructed, afford the means not only of drainage for the soil and removing all excess of moisture, but they also furnish facilities for disposing of the waste water and fluid filth which must necessarily be the product of a numerous population. If thrown upon the soil or pavement, these matters undergo the process of decomposition and evaporation, filling the air with their mephitic gases, and add their quota to the numerous other sources of contamination.

Among the numerous improvements which constantly demand the attention of the municipal authorities, sewerage and paving should receive their earliest attention, and a plan for reaching the *entire extent of the town* adopted and systematically and vigorously prosecuted. Upon the score of economy, sewers should be laid in the streets before the paving is laid down; both works can in this manner be the most effectually performed.

A great error is generally committed in not constructing the sewers of sufficient capacity for accomplishing the work they have to perform; and, moreover, they frequently have not sufficient depth beneath the surface of the soil to fulfil the objects for which they were designed. They should in every instance be of sufficient depth to insure perfect drainage of the cellars of the buildings upon the street, and remove every opportunity for the accumulation of moisture beneath the floors. Side sewers should emerge in all directions, and furnish the most ample facilities for the inhabitants to employ them for all the purposes for which they are designed.

Every inlet should be guarded by stench traps, and the greatest care taken for the prevention of the escape of any odors or gases from them, back into the streets or houses. The fact should not be lost sight of, that by sewerage you have only removed your filth from the surface to beneath the soil, and that, if improperly constructed, the deleterious influences of the mass of filth accumulated therein may ascend to the surface and exert still its deleterious influences. Provision should consequently be made for the frequent cleansing of the same, by turning into them from time to time a supply of water sufficient to effectually wash them out and remove all impurities. This is especially essential during the droughts and heats of summer. It is seldom during this hot season that there is sufficient rain to keep them clean, and the foul smells which emanate from them can scarcely escape the notice of any

who may be so unfortunate as to come within their vicinity. It is perhaps unnecessary to remark, that the discharge of these underground channels should always be into some watercourse of sufficient capacity and current to remove all the contents far beyond the precincts of the town.

Our sewers undoubtedly furnish the most simple and feasible means of getting rid of that great nuisance of cities, the night soil. The disposition of this material is one of the most perplexing questions that present themselves to the consideration of the municipal authorities. As it usually exists it is a nuisance, it creates a nuisance to remove it, and it forms a nuisance where it is redeposited. With a full supply of water and properly constructed sewers, its accumulation may be prevented, and the evil consequent therein avoided.

I would add, as a conclusion to this branch of our subject, that the superintendence of the construction of all sewers, lateral as well as main, *should be confided to the charge of the health officers of the town.*

The convenience of paved streets generally insures their construction in the business portions of a town, and they are gradually extended with the increase of business and the wealth of the inhabitants; but the importance of pavements to the health of the community is not, I think, generally recognized. Observation has abundantly proved the beneficial influence exerted upon health, by paved streets. Nor can it be otherwise, for in no other manner can a street be kept dry and clean, and all impurities be removed. With a street properly sewered and paved, and a good attention given to the frequent removal of all filth which may gather upon the surface, a most important end will be accomplished towards the preservation of the public health. The importance of paved streets to the comfort, convenience, and health of a community is so apparent as to require no argument, and we shall dismiss the subject with this simple allusion to it.

I wish to call attention to a subject which seems, until quite recently, to have escaped notice. I refer to the influence exerted upon the health of a city by the upturning and removal of the natural soil, especially in times of epidemics. This breaking up of the earth is generally the result of those works of improvement and repair constantly going on in the midst of a city population, such as the preparations for paving, the building of sewers, the laying down of water and gas-pipes, the digging of canals, and

basins, and the innumerable excavations, which are constantly being made. These labors, for convenience, are generally undertaken in the spring, and extended throughout the whole of the heats of summer and autumn, and the fresh earth in this manner exposed to the sun during the warmest part of the year.

The question of the sanitary bearing of such labors upon a population is a most important one, for its definite decision would furnish a rule by which the authorities might be governed in the prosecution of their various enterprises. Since public attention has been called to this subject, it is certainly very important to decide how far such an influence is exerted, and whether such exposures of the soil to the heat of the sun and the influences of the atmosphere have the power, under ordinary circumstances, of generating diseases *de novo*, or whether a malign influence is exerted by them only in seasons of epidemics, when they add another to the numerous terrene agencies concerned in the development of the specific disease.

It would seem hardly possible that the simple disturbance or upheaval of the soil should be productive of serious difficulty, and so long have escaped notice. Intramural excavations have been prosecuted from time immemorial, and such results would undoubtedly long since have been unmistakably recognized, and the consequences have been an abandonment of all such labors, or the depopulation long since of every city on the face of the globe. Perhaps the facts bearing most strongly in favor of the deleterious influences of such causes, is the influence sometimes noticed in the production of malarious diseases in a newly settled country by the ploughing and turning up of the virgin soil; and the production of the same diseases along the lines of the excavations and embankments of a railroad, or canal, which present the most exaggerated examples of earthwork and disturbance of the soil we possess. But in either of these examples the result is not uniformly the development of any such diseases; and it may be well questioned whether in those cases of their production some other element is not also actively employed in the elimination of the malarious manifestations.

In seasons of epidemics the question is not so difficult of solution. I think abundant evidence is already accumulated to fasten conviction of the disastrous influences exerted by the exposure of the upturned earth to the sun and atmosphere, during those months when there is present any epidemic tendency.

Dr. E. H. Barton, in his "Report upon the Sanitary Condition of New Orleans,"[1] remarks: "That since 1796–7 to the present time there has been no great epidemic of yellow fever in this city, without an extensive breaking up, disturbance and exposure of the original soil of the country; that this has consisted in digging canals and basins, or cleaning them out, either in the city or its immediate neighborhood; digging and excavating the streets of the city for the purpose of laying down gas and water-pipes, and relaying the streets; digging and embanking for railroads, and similar purposes in the summer season; and that the extent and malignancy of the disease have been pretty much in proportion to the extent of these exposures."

Dr. Barton gives corroborative testimony in support of this position, occupying in the details some six pages of his report.[2] The histories of the ravages of yellow fever subsequent to extensive excavations in Natches, Memphis, Mobile, Charleston, Natchitoches, and several other less prominent places are given. In all, the close connection existing between the amount of work performed and the extent of the prevalence of the disease is traced.

Although Dr. Barton labors to excite public vigilance in the sanitary government of his city, and endeavors in the plainest and most forcible language to teach the doctrine of the local origin of yellow fever, and prove its home-birth, he does not regard the upheaval of the soil, or any other form of terrene agency alone, sufficient to develop that disease; but that certain meteorological conditions are necessary to propagate the disease.

The distinctive doctrine of the report on the causations of yellow fever is thus enunciated:[3] "That the emanations arising from the upturning and exposure of the original soil in the summer season, together with filth, *under certain determinate atmospheric conditions*, have been the main, if not the special cause of every epidemic yellow fever that has ravaged not only this city, but the south-western part of the United States for more than half a century."

The close connection between severe outbreaks of cholera in localities where there has been much disturbance of the soil, and the persistent sojourn of the disease in such vicinities, seeming often to advance along the lines of the works and follow their progress as they

[1] Report of the Sanitary Commission of New Orleans, p. 312.
[2] Ibid., pp. 315–21.
[3] Page 322.

are extended from day to day, has been noticed. The phenomena witnessed under such circumstances inculcate instructive lessons in the part borne by local causes in the development of this epidemic.

A striking and melancholy example of the ravages of the disease under such circumstances, was witnessed at Buffalo during the epidemic visitation of 1852, upon one of our most cleanly, well built, and respectably inhabited streets. The history of the occurrence was gathered at the time by Prof. F. H. Hamilton, and made the subject of a report to the Buffalo Medical Association. We shall make use of this report, giving its language when convenient.

The street is known as Ellicott Street, is on the east side of Main Street, being the second street distant. The space of epidemic visitation was limited to two squares in length; the north line being Eagle Street, the south line South Division Street; and was crossed at the centre by North Division Street; the entire limit being some five or six hundred feet in length.

The topography of the territory is thus given in the report:—

"Not many years ago a marsh occupied the ground where this street is built, covered with a deep, soft, alluvial mould. The marsh extended from near Washington Street to about where now Michigan Street lies, and from Goodell to Swan. It had its outlet towards the corner of Swan and Michigan, or in that direction. This marsh was the result of a peculiar formation of the clay bed, which to the depth of ten or twenty feet underlies nearly all that portion of the city which is east of Main Street, and below High Street. The strata having a dip from Main and Michigan, from Goodell and Swan towards a common centre. To this clay basin, only partly filled in its deepest portions with sand, there was no actual outlet, except the slight depression towards the southeast; and it remained, therefore, until intersected by ditches, the depot for all the surface drainage of the higher neighborhoods—a general receptacle for water, alluvium, and sewers.

"Upon this soil much of that portion of the town is built; for in paving the streets, with few exceptions, none of the surface earth was removed, but the sand was deposited for pavements above it. The streets thus became higher than the adjoining lots, and the water being thrown back upon them the owners found it necessary to fill them up. So this whole bed of alluvium was at length buried up, and there it has remained to the present time. No less rich and fertile and redolent of disease, however, to day than before

it was inhumed—when it was regarded as unsafe for any family to live within the reach of its miasms.

"Since the pavements were laid, the lots filled up and the sewers made, this part of the town has been as healthy as any of those portions which are underlaid with clay—indeed much more so, I think. Ellicott Street especially, and particularly at this southern extremity, has been regarded as healthy. In 1849, fewer deaths from cholera occurred in this street than in Washington, Elm, Oak, or in any other parallel street of equal length east of Main; and I am informed by a resident that not one death occurred from this cause, in that portion of the street of which we are now speaking. And this fact may be explained by the size and comfort of the dwellings, which are mostly of brick; by the neatness and spaciousness of their yards, which afford them sufficient ventilation; by the cleanliness of their street, and the completeness of their sewerage, which last possesses also, I am told, this remarkable advantage over other sewers, that it has running through it most of the year, if not constantly, a fresh current of water, which finds its supply in springs around the foot of court-house hill, and from other parts of the clay basin.

"In short, for several years the occupants of these houses have enjoyed that immunity from epidemics and other diseases which the science of etiology would have taught us to expect for them, and to which their own diligence in the abatement of the usual causes has eminently entitled them.

"During the present season the reputation of this locality for healthfulness remained unchanged; not even the ordinary diseases of summer were known to have prevailed. The long and persevering drought, with an unusual degree of heat, brought no change.

"On Saturday, July 24th (1852), a ditch was commenced at Eagle Street, four and a half feet deep, and two feet wide, for the purpose of laying water-pipes. The work was regularly carried on through Saturday, Monday, Tuesday, and a part of Wednesday forenoon. On Monday night it was partly open near the corner of North Division and Ellicott. Wednesday morning it was opened to South Division Street.

"The length of the ditch was about 200 yards, and the number of dwellings fronting upon the street, from Eagle to South Division, was twenty.

"The soil through which the ditch was dug, was, directly underneath the pavement, a coarse sand of about one foot in depth, then

a rich loam averaging about one foot also; and underneath this, sand of a reddish or yellow color, either coarse or fine at different points. The clay bed beneath was not reached."

The first case developed itself on Monday evening, July 26th, in a recently built and very comfortably constructed brick house on the northwest corner of Ellicott and North Division Streets. The sufferer was a married lady, who had been in feeble health for some months, but with no intestinal disease, was attacked with a slight diarrhœa. On Tuesday it returned with increased severity, and on Wednesday forenoon cholera was distinctly announced, Friday morning at 2 o'clock she died.

On Tuesday morning it manifested itself in a brick house on the east side of Ellicott Street, three doors north of North Division Street. Mr. W. arose, feeling ill and having a diarrhœa; and his wife awoke with a severe headache, and early in the afternoon was attacked with a diarrhœa, speedily followed with unequivocal symptoms of cholera, and died the afternoon of the next day. An apprentice who lived in the family, and slept in the house on Monday night, went to Niagara Falls on Tuesday morning, returning in the evening feeling as he thought sea-sick. He reached home between 9 and 10, and retired without mentioning his illness. About 11 o'clock his condition was discovered, when he had unequivocal cholera, and he died 10 o'clock the next morning. On Wednesday morning three of the children were attacked with cholera, two of whom died. The servant girl was also attacked Wednesday night or early Thursday morning, and died Thursday afternoon.

On Wednesday, at No. 27 Ellicott Street, east side, two other cases occurred, a man and his wife; both were fatal.

On Thursday, some eight cases more are recorded, none fatal. No new cases were developed after Thursday.

There were in all nineteen cases, of diarrhœa, with manifest cholera tendency, or actual cholera, all being so ill as to require medical attendance; and of these nine died. They all occurred within the distance of a few rods each way from the centre of the ditch, near the intersection of North Division with Ellicott Street. Of twenty families living upon the street, the epidemic showed itself in nine. By one o'clock P. M., of Thursday, the ditch had been completely closed.

Dr. Hamilton declares that, "My conviction is, under all the circumstances, that these cases all had their source, more or less

directly, in the miasms from the ditch. I have no doubt other causes may have concurred and materially promoted the result—eating sour or unripe fruit—alarm—even contagion I admit: yet neither one nor all of these are sufficient to explain many of the cases. They did not all eat fruit—several were attacked simultaneously—children and almost infants were in many instances its subjects.

"The weather was very warm, and immediately when this old bed was opened and brought to the surface, a rapid decomposition and elimination commenced. During the day the heat of the sun so rarified the air, that the mephitic or poisonous gases arose rapidly and were borne off; but during the night, when most of the attacks commenced, these exhalations settled and hung upon the houses and their unsuspecting occupants, like the heavy vapors of a pit."

Dr. Hamilton, in a subsequent report, made as the chairman of a committee, appointed "to investigate the influence of upturning of soils in the causation of Asiatic cholera," collected the statistics of the progress of this epidemic, in 1849, along the line of an extensive ditch dug through Genesee Street, a street running from east to west through the town, and all that portion east of Main, and in which the disease prevailed, is settled exclusively by our German population.

For the purpose of building a sewer, "a ditch was commenced in Genesee Street, at the intersection of Michigan, about July 1, 1849, and it was opened and completed through to Hickory Street, by about the 20th of August; the work of opening, laying the sewer, and refilling being carried on simultaneously—so that it was closed its entire length very soon after the excavation was completed. The excess of earth was, however, not removed until about the 14th of September. The ditch was 1200 feet long, two feet wide, and from eight to ten feet deep.

"The soil through which the ditch was excavated was first, one foot of paving sand, then clay to the depth of two or three feet, and finally hardened quicksand, or clay and sand in mixture."

The entire number of cases of cholera upon the whole length of the street, as accurately as could be ascertained, was, during the season, 97. Whole number of deaths, 41. Of these, 61 cases and 21 deaths were confined to the space from Michigan to Hickory Streets, the line of the sewer. Between Hickory and Pratt Street, the first street east of Hickory, and about three hundred feet distant, and of course the same distance from the eastern termination

of the sewer, there were 32 cases of cholera, and 17 deaths. But one case is recorded further east of this point. Of the cases within the above described and limited territory, 20 cases and 4 deaths occurred previous to July 1st, the period of commencing the labor; and 68 cases and 30 deaths were between July 1st and Sept. 14th. After this period there were but 5 cases and 4 deaths.

"It will not escape your observation, that nearly all the deaths were along the line of the ditch, or within 300 feet of its north-eastern extremity, in which direction our winds would be most likely to carry the miasms. If the watercourses were obstructed, also, the refluence would be in the same direction, as the street has a declination from east to west and south."

The report adds: "Attempting to carry our investigations into other streets, through which ditches were opened during the same season, and in which it had been said that similar consequences had followed, we found our inquiries ending in no satisfactory results, and we therefore soon ceased our examinations. Ditches were made generally for the purpose of removing nuisances, in many streets, and in one instance, at least, by request of the inhabitants. Such was the fact in Cherry Street. The street was covered in various places with stagnant pools of water, and the lots had no means of drainage. In this condition the cholera broke out among the inhabitants, and they soon petitioned the Common Council to have a drain built, in the hope that the disease might be thus arrested—but the cholera continuing to increase in severity after the work was commenced, and the completion being somewhat delayed, they again petitioned hastily to have it closed."

During the cholera visitation of 1854, there were no extensive excavations of any kind in the city, and this page in the history of the experience of the sad effects of the epidemic was left clear from the burthen of such a mournful record.

In the history of the sudden outbreak and fearful ravages of cholera, at Suspension Bridge, below the Falls of Niagara, and at the Falls themselves, during the month of July, 1854, may be found strong corroborative testimony upon the point under consideration.

Niagara Falls and its vicinity had always enjoyed an entire immunity from the visitations of cholera. The only cases ever known, were two, in 1849, a gentleman and his wife from Buffalo, who both died the same night; and in 1852, a young man, also from Buffalo, went down to attend the Scott's celebration, was taken sick on the road, and died a few hours after his arrival; and about a

week later, one of their most respectable citizens died of the same disease. This completes the history of their experience with the epidemic up to the date, July, 1854.

In 1852, the village of Niagara City had its birth, at the end of the Niagara Falls Suspension Bridge, about one and a half miles below the Falls. In 1854, it numbered a population of one thousand.[1]

The soil at this point is chiefly clay, with a thin surface of alluvium. Near the banks of the river, where the ground is somewhat lower, the rock approaches the surface and is in many places uncovered. Situated mostly on high ground, which declines rapidly toward the river, its surface drainage had hitherto been complete, and it has received the benefit, in whatever direction the wind might be, of a pure air.

The first case of cholera which ever occurred in the village among its inhabitants, was on the 17th of July of this year (1854), in the person of an American citizen and a very intemperate man. The second, was on the 19th, an old lady, of excellent habits, also a resident. From this day it increased with terrible rapidity and fatality.

On the 21st, ten died; on the 22d, thirteen died, and it then gradually declined, and the last fatal case occurred on the 31st. Between the first and last dates, a period of fourteen days, about thirty-seven died, and about twenty more were attacked and recovered.

On the 19th of July it also broke out, on the Canada side of the river, at the other end of the bridge. The total number of cases on both sides of the river was ninety, and the number of deaths, seventy.

In consequence of the numerous improvements, public and private, going on at these points, an immense amount of excavation and removal of earth had been performed. The character and extent of these is succinctly set forth in the following extracts from letters descriptive of the ravages of the epidemic, by Dr. R. J. Rogers, the physician of the place:—

"In regard to what our citizens believe to have been the cause of the cholera, I would say there has been no great amount of talk or speculation in regard to it. They are all aware, that ninety per

[1] The account here given is condensed from the history of the epidemic, contained in the "Sanitary Reports of the City of Buffalo, for 1854. By J. M. Newman, M. D."

cent. of the deaths occurred among those who either lived or did business on the low grounds in the vicinity of the bridge. Before the sewer was constructed, the railroad banks had turned off the surface water into unnatural channels; consequently, it flowed over the surface of a great portion of the low land around the bridge. It was "a crying evil" in the spring, and was wet more or less through the month of June. The cellars, too, were not well drained, and many houses had no cellars, yet sufficient excavation to let water and dampness accumulate around and under them.

"The principal excavations here, this summer, have been made by the railroads. A large amount of the natural earth has been removed, and carried down to fill up the grounds in the vicinity of the bridge and the road leading to it.

"The first case was an *imported* one, and occurred on or about the 14th of July. An Irishman came on the Great Western Railroad from Canada, and died the same night.

"The first case on the Canada side occurred on the 19th of July, the patient a female. I cannot ascertain that any but laborers and their wives died in Canada.

"They have excavated a great deal on that side. The Great Western Railroad passes through a deep cut, and the dirt was brought forward to fill up a deep ravine running nearly parallel with the river. A stream of water passes through this ravine, but there are no pools. The embankment is principally dry clay and gravel."

The cholera also prevailed, with more or less severity, at the Falls itself, a mile and a half from the bridge; and, it will be remembered, for the first time, with the exceptions already noticed. There was much reluctance upon the part of the citizens admitting the presence of the epidemic at this time, and full details were not attainable. The following brief sketch of some of the particulars was furnished by Dr. C. S. Ware, a resident physician of the place:[1]—

"The first case was an Irishman, employed in sawing wood for the railroad. He had been exposed to the disease among some Norwegian emigrants at the depot, and also lived in the immediate vicinity of the public works, where a number of cases occurred a few days after.

"I can form no idea of the number of fatal cases this year. The

[1] Sanitary Reports, City of Buffalo, 1854.

epidêmic began the first day of July, and ended the last week in August. Probably ninety per cent. of all the victims were Irish laborers, and they for the most part are intemperate, and live in poorly ventilated shanties.

"The laborers' shanties are built along the line of the canal, in three distinct patches. The first patch contains nearly half of all the laborers. Their houses were built in a grove of small hickories, but not very much shaded. The dirt was taken from a part of the canal and spread over the ground, all about the shanties in this grove, *and it was in this patch that at least seventy-five per cent. of the cases occurred.*

"The middle patch was not so much shaded, and not nearly as much of fresh earth was deposited. The cases here *were milder and much less frequent, and but few deaths.*

"At the upper patch, situated on the bank of the river, and where there was *no* fresh earth left, *not a single case occurred during all the summer.* In this patch there were some twenty or thirty shanties, with a proportionate number of occupants, and excepting locality, all lived in the same manner."

Enough I think has been shown to exhibit the dangerous influences exerted by disturbance and exposure of the soil, during the prevalence of any epidemic influence in the atmosphere. In an absence of any such influence, or what perhaps would be popularly called "a time of health," such results would not be looked for.

It is perhaps useless to attempt to inquire what element is contained within the earth, which is capable of being eliminated into such a deadly poison. The agent is doubtless too subtle for our grasp, and if we call it *malaria*, or give it any other name, we shall but employ the drapery of language to conceal the nakedness of our ignorance. It concerns us more to know if we may escape the sad results springing therefrom.

It would seem undoubted, that the emanations of such exposures, under the influence of heat and a humid atmosphere, have the property of giving the most fatal intensity to that form of disease which may be determined by the epidemic constitution of the year. In other words, the meteorological elements are what are wanted, and all that are needed to the production of the epidemic.

The prosecution of this subject would open the whole matter of meteorological influences in the production of epidemics. Heat and humidity undoubtedly play important parts in the production of disease, and when they are united to filth, or foul emanations of

any kind, either from within, or from without the earth, disease may result, so intense in its action and fearful in result that epidemic may be truly written against its name. The prosecution of this subject would, however, be out of place here. It was discussed in a report presented last year to the Association by Dr. S. B. Hunt.

The most important question for us to decide at the present time, is, how far the teachings of meteorology in their connection with hygiene, can be made subservient to the benefit of mankind? If we are able to read the approach of the epidemic in the registration of atmospheric vicissitudes, can we control these "powers of the air" so as to disarm the pestilence of its virulence and save our race from suffering?

Several important lessons may, I think, be learnt from the consideration of this subject. We learn the compound character of the agencies concerned in the elimination of those morbid influences which exert such malign power upon the human system; that for the elimination of these poisons the whole series in the chain of causes and effects are needed, and the absence of one only would defeat the consummation of the event. As in chemistry, all the elements in their precise proportions and order are needed for the production of any given compound, so here the absence of a single element will modify and change the result of the combination.

That if it be admitted that we may not, or cannot know in advance what is to be the epidemic tendency of the year, yet possessing so much knowledge as will enable us to break up the order of secondary causes upon which the manifestations of its power depend, we possess knowledge sufficient and ability abundant for the prevention of the evils which follow in the train of the pestilence.

That if subsequent observation and experience confirm the present theories as to the intimate relation of solar heat and atmospheric humidity in the production of disease, it will be in the power of man from day to day to observe and foretell the advance of an epidemic in the approaching coincidence of the lines of disease upon the thermometer and hygrometer.

I have but little doubt, that when the results of meteorological observations are better understood, and the laws thereof plainly deduced, that it will be made the duty of our Boards of Health to publish from day to day, for the benefit of the public, the changes of the instruments and the deductions to be drawn therefrom. Nor would such publications be devoid of interest, or without their use. Aside from the greater probability that would ensue of increased

vigilance in the preservation of cleanliness, power would be given all to guard against the injurious impressions of atmospheric vicissitudes. While it is admitted that we may not hope to ascend so high as to be able to control the never ceasing changes of aerial temperature and humidity, yet we may guard ourselves against very many of the effects produced by these causes. We can guard our dwellings against dampness, insure perfect drainage, remove all excess of moisture, and prevent those common results of humidity witnessed in our habitations in the form of mould and mildew, by ventilation and artificial heat. This accomplished, and with perfect cleanliness, we have removed two at least of the links in the chain of the causations of disease.

The subject of earth disturbance should not, perhaps, be dismissed, recognizing, as we are compelled to do, its deleterious influences, without the observation, that within cities particularly, and in seasons of any epidemic tendency especially, extensive exposures of the soil are not to be recklessly undertaken; and at all times their prosecution during the extreme heats of summer, is to be avoided as far as possible. And that, in every instance, every excavation should be refilled as speedily as possible, and all superabundant earth is to be removed immediately from the street. That in no instance is the drainage of the surface to be obstructed, nor any watercourse made to overflow the surface, or the waters turned into unnatural channels; that, previous to the prosecution of the work, provision for perfect drainage should be provided, and, during its progress, faithfully maintained.

I have deferred to this place the consideration of one of the zymotic diseases, as its causes, modes of propagation, and means of sanitary control are so entirely different from any other disease of its class, that its consideration could, with the greatest propriety, be separated entirely from the balance of the series.

I refer to SMALLPOX. I apprehend that but few persons are aware of the actual extent of the disease in the land. Vaccination has done so much to control the disease, and has it in its power undoubtedly to entirely eradicate it, that we have accepted its ability to accomplish, for the actual accomplishment of the result.

The "Mortality Statistics of the Census of 1850," give the number of deaths in the United States for the year, from smallpox, as 2354. Of these, 2057 *were born within* the United States, so that, unlike some other diseases, we cannot shelter ourselves under the so-frequent plea, that it is our careless, newly-arrived emigrant population

who suffer as a consequence of their peculiarities of habits and excessive exposures.

In Massachusetts, for 13 years and 8 months, ending December 31, 1854, the number of deaths from this cause was . .	976
The total for the last five years was	729
The yearly average for the last five years was	145
The number for 1854 was	207
Being 1 per cent. of all the deaths for the year.	
In Rhode Island, for the year 1854, the deaths from the same cause were	11
All being in the City of Providence, and furnishing 0.61 per cent. of all the deaths from specified causes in the state.	
In Kentucky, the deaths from the same cause in 1852 were .	14
" " " 1853 " .	8
" " " 1854 " .	26
In Boston, in 1854, the deaths were	118
" 1855, "	182
"With the exception of 1850, when there were 192 deaths from this cause, it has been more fatal the past year than it has been for the last five years."	
In New York City, in 1853, the deaths were, including varioloid	681
" 1854, " " .	624

The various mortuary reports of the country speak of the prevalence of this loathsome disease, and the almost uniform language is, that it is on the increase. And our daily papers have of late frequently alluded to the augmented frequency of the disease in various sections of our country. Indeed, there would seem to be no little cause of apprehension of its extensive prevalence in country as well as town.

Such facts may well excite our surprise. An explanation can alone be found in the ignorance, or, what is worse, the carelessness of the public.

There are probably but very few to be found who do not know of the inestimable value of vaccination, but many carelessly defer the operation from time to time until it is entirely forgotten, and they are aroused only to a full sense of their imprudence by an attack of the disease. More, perhaps, are ignorant of what constitutes a genuine vaccination, and have the operation imperfectly performed. Others are unacquainted with the necessity there frequently occurs of more than one vaccination being required to render the system fully protected against the variolous influence, and that, under this semi-protected state, the individual is susceptible to the contagion, and liable to an attack of variola, though

probably in a modified form. The knowledge of an *apparent* failure in the protective power of vaccination, perhaps, begets distrust of its real value in the minds of some, and serves to add to the sum of fatal results.

The public should be thoroughly assured of the absolute power there is in vaccination to protect the human system against the contagion of smallpox, but that this immunity is purchased by *thorough vaccination alone*, a condition of the system which may not be obtained by a *single* vaccination, but *only after a frequent repetition* of the operation.

The report of the Committee on Medical Sciences for 1850,[1] contains a series of propositions upon the subject of vaccination, the results of the observations of the late Dr. Fisher, of Boston, which are so applicable to this subject that I deem no apology necessary for reproducing the following from the series, as containing, upon this subject, truths of the most vital importance for the public:—

"1. That one single and perfect vaccination does not, for all time, in all cases, deprive the system of its susceptibility of variolous disease.

"2. That one or more revaccinations *do;* and that consequently, a physician should recommend revaccination, when questioned as to its necessity.

"3. A portion of vaccinated persons are protected from smallpox through life by one vaccination.

"4. An indefinite number are protected only for a certain period of time.

"5. The length of time they are thus protected is undetermined.

"6. Some individuals require to be vaccinated a number of times during life.

"7. The system is protected from variolous contagion, *when it is no longer susceptible of vaccine influence, as tested by revaccination.*

"8. The appearances of vaccine cicatrices furnish no indication that the system may or may not be again influenced by repeated vaccination.

"9. The lapse of time from the period of primary vaccination to that of revaccination has some, though but little, effect in preparing the system to be further influenced by the vaccine virus.

"10. The age of puberty tends in a degree to destroy the effects of primary vaccination."

[1] Trans. Amer. Med. Assoc., vol. iii. p. 73.

The manner of abating the ravages of this loathsome disease is self-evident—*effectual vaccination of the entire population.*

But experience has proved that there is but little probability of such an event being brought about, if the matter is left to individual action. Ignorance, carelessness, recklessness, all serve to overcome the sense of self-protection, so powerful generally in the human breast, and to preserve a very large portion of every community constantly liable to the attacks of the disease, and render certain an abundant supply of virus actively at work among the people.

Compulsory vaccination can alone reach and remove the evil. It is the right of the community, as well as a duty it owes itself, to protect itself from the evils of such a contagion, and destroy the sources from which they spring. This is a matter in which our rural population is as much interested as those who dwell in cities. They are liable, if unprotected, to experience the full severity of an attack, and the inquiry is pertinent, whether they do not suffer *more* than the citizen, in consequence of the greater alarm and excitement it produces when it makes its appearance in the country.

By the law of the land, for municipal laws alone will only partially remove the danger, every person should be compelled to be perfectly vaccinated, and the requirement should commence at the earliest infancy. Some penalty should be inflicted for a neglect of this duty.

It should be made a prerequisite for admission into any public school; and one of the sanitary rules of every public institution, educational, penal, or charitable should be the assurance of safety against this contagion, by vaccination.

Physicians should be appointed at the public expense at convenient points, for the gratuitous vaccination of all those whose poverty might otherwise deter them from a compliance with the law.

Prussia has long had such a law in force, and England has recently enacted statutes designed for the general vaccination of the people. Boston, in our own country, has, I believe, similar municipal regulations, and perhaps other of our cities may also have. To be really effectual it must be apparent, that such laws should extend over every State in our Union.

In concluding this report, I wish, not only for the benefit of the public, but as an act of justice to our profession, to advocate the appointment of medical men upon our local Boards of Health, and confiding the matters appertaining to the execution of Sanitary Police Regulations, to the hands of the profession. I advocate this

not only as a measure for the benefit of the public, and from which they would be actually the greater gainer, for the studies, and pursuits of the physician are such as must eminently qualify him over any other class of our citizens for the discharge of such duties; but as an act of simple justice and as a recognition upon the part of the public of the value of the services daily rendered by the profession and directed toward the preservation of the health of the people. From medical men are expected to emanate every measure designed to prevent, as well as cure disease, and their labors are constantly as much directed toward this end, as to the cure of a malady when once developed.

These labors are too often unrequited except by empty thanks, and these too often are forgotten to be bestowed. The public is too well satisfied to accept these labors as a gratuitous—matter-of-course; and occupy every post of profit, though they legitimately belong to those who so freely labor in their behalf.

The liberality of the profession is proverbial, and regardless of self, they cheerfully labor in every department which may assuage human suffering and dry up the sources of disease and death; still physicians are not exempt from the commonest wants of humanity, and are as much dependent upon their labors for their support as any other portion of the community.

I boldly contend that to the physician belong the posts of honor and of profit conferred by the constitution of any Sanitary Commission, Board of Health, or any other office which is designed to devise and execute hygienic laws.

These posts are now too frequently given merely as the rewards of party service to men no way qualified by habits of observation and study for the positions they occupy. And the indifference with which our present laws are executed in reference to health matters, springs in a great measure from the ill-adaptedness of the officers to the duties they have assumed to perform.

Let men be selected from the ranks of the profession for these posts who will bring to the exercise of their duties a laudable professional ambition, and work from a love for their labors, and be actuated by the true spirit of the sanitary physician.

APPENDIX.

SHORTLY after the completion of this portion of my report, the subjoined report of a committee appointed by the Legislature of New York, at its late session, was published.

The resolution under which the Committee was appointed, fully explains the object, and the report itself most completely indorses every position we have assumed.

This legislative report is short, but exhibits the horrors of the situation of the poor in New York and Brooklyn. The subject is thus invested with all the authority of legislative sanction, and perhaps the details will more readily be accepted as true than would individual reports.

The importance of the investigation, and the intimate connection it has with the subjects discussed in our report, are the only apology we offer for its insertion in this place.

IN ASSEMBLY, April 4, 1856.

Report of the Special Committee on Tenement Houses, in New York and Brooklyn.

The Special Committee appointed under the following resolution—

"*Resolved*, That a committee consisting of five members of this House, be appointed to make an examination of the manner in which tenant houses are constructed in the city of New York, and report the same to this Legislature; and also, if any, what legislation is requisite and necessary in order to remedy the evils, and afford full protection to the lives and health of the occupants of such buildings," submit the following report:—

That in accordance with the above resolution, they proceeded to New York on the 14th day of March, and again on the 25th day of March, and spent on the first visit three days and on the last four days, in a personal inspection of some of the best known of

the tenant houses in the city, and in receiving from the proper authorities such information connected therewith, as it was in their power to furnish. In the brief space of time allowed them for the investigation, your Committee have been enabled to do no more than glance at evils of such magnitude, as to imperatively demand a thorough and searching scrutiny; and they are sensible that their labors will be unattended by any practical result, unless they succeed in impressing upon your honorable body a conviction of the necessity that exists for an extension of their powers, with a view to perfecting some plan of reform upon which future legislation may be based.

At this late period of the session, and when legislative action cannot be taken, it would be a needless encroachment upon your time, should the Committee lay before you in detail all the facts they have elicited and all the sights they have witnessed in the exploration of the haunts of misery, poverty, and vice in the metropolis. They deem it sufficient for their present purpose to state generally, that the examination they have made has convinced them that the evils sought to be remedied are of a serious nature, requiring the attention of the State Legislature, and demanding such action at the hands of the present Assembly as will secure their ultimate removal.

In order, however, that your honorable body may appreciate the magnitude of these evils, and the injurious influence they must exert upon the prosperity, health, and happiness of the community, your Committee deem it expedient to set before you the following condensed facts.

Partial returns, made up hurriedly by the captains of the police for the use of the Committee, show that in *twenty-two* districts there are over *one thousand two hundred* tenement houses of the very lowest description, occupied by not less than *ten families* each. In some of these as many as *seventy* different families reside, and into a few over *one hundred* families are crowded. A number of these dwellings were visited by your Committee. In one building one hundred and twelve families are residing, some of them numbering eight or ten members, occupying one close, unventilated apartment; and others huddled indiscriminately in damp, foul cellars, to breathe the air of which is to inhale disease. Here, in its very worst aspect, are to be seen the horrors of such a mode of living. Here are to be found drunken and diseased men and women, lying in the midst of their impurity and filth; idiotic and crippled children,

suffering from neglect and ill-treatment; girls just springing into womanhood, living indiscriminately in the same department with men of all ages and of all colors; babes left so destitute of care and nourishment as to be fitted only for a jail or a hospital in after years, if they escape the blessing of an early grave. Indeed, no language could faithfully depict the suffering and misery witnessed even in the hurried visit paid by the Committee to these hotbeds of immorality, drunkenness, and disease.

In the ninth district, out of seventy houses reported by the captains of police as being let in tenements to not less than ten families, forty are designated as "*in a very filthy condition, unfit for human habitation*," and all of these are occupied by from *sixteen* to *thirty-five* families each. In the 10th district, out of *seventy-six* houses, a majority are occupied by as many as *seventy* distinct families, and are reported as in a filthy condition, without ventilation, and destitute of the accommodations necessary for the use of civilized beings. In the 11th district, in which are some seventy houses of a like description, the report says: "Of all the tenement houses in the district, 'Folsom barracks' and 'the cottages,' are the most wretched and filthy, alike disgraceful to the owners of the property, and the city that tolerates such nuisances. It could not fail to be a matter of surprise to any one who would go through and examine them, that the occupants did not all die of pestilence generated by their unspeakable filth and dissolute habits of living." In this and other localities, your Committee found many of the apartments so destitute even of light as to render it an impossibility to read a newspaper within them at noonday.

In the 13th ward, in a building known as Manhattan Place, there are *ninety-six* separate apartments. These are inhabited by *one hundred and forty-six* families—or more than one family and a half, on an average, to each room—numbering in all *five hundred and seventy-seven* persons, or about six individuals to each single room. The health warden, in his report setting forth these facts, says: "These premises are three stories high, the cellars are in a bad condition, the sinks filthy, and the ventilation poor. In the summer season these premises are known to be very filthy, and not the least attention is paid to them whatever by either owner or agent; their sole aim, apparently, being to make money; exhibiting in the same an entire disregard to all law whatever."

In the houses visited by your Committee, sights were presented to them alike startling and painful to behold. In many, whites

and blacks were living indiscriminately together; negro men with white women, and white men with negro women. Young faces, haggard with want and sickness, and bearing that peculiar look of premature old age imparted by early sin, gazed at them from every corner; misery and vice in their most repulsive features met them at every step. Scarcely an apartment was free from sickness and disease, and the blighting curse of drunkenness had fallen upon almost every family. Here and there might be found, it is true, some attempt at cleanliness, some display of a love of home, some evidences of industry and sobriety, with their natural accompaniments, cheerfulness and good health. But these, your Committee found, were in most instances families that had not long been inhabitants of the neighborhoods in which they lived. The demoralization and ruin apparent all around had not had time to do their work on them. It is to be feared that too soon the miasmal air will creep into their systems, undermining the sturdy constitution, and prostrating its victims on a bed of sickness. Health failing them, want will follow; and then must come crowding rapidly upon them, neglect of home, neglect of children, uncleanliness, drunkenness, and crime. This is no fancy sketch, no picture of the imagination. It is a stern reality, enacted every day in the midst of luxury and wealth, the natural and fearful result of the rapacity of landlords in an overcrowed city, unrestrained by conscience, and wholly unchecked by legislation.

Many of the buildings that are thus rented to the poor, realize for their owners *larger* annual incomes than do the first class dwelling houses in the best parts of the city. And yet they are estimated by the assessors as almost valueless, and escape anything like a fair taxation, notwithstanding they are the principal cause of the heavy burdens imposed upon the citizens of New York for the support of the criminal and the poor. This is, of itself, a forcible argument in favor of some active legislation upon the subject of tenement houses.

In these buildings, thus crowded with human beings, there is, with scarcely an exception, but one narrow stairway; and egress to the multitude inside, in case of fire, is an impossibility. Common humanity demands some law against this evil.

Every underground cellar in these tenement buildings, that is not absolutely flooded by water and filth, is made a lodging room for one or more wretched families. All of these are destitute of any species of ventilation; in most of them the floors are thick

with putrid mud, and the pipes and sinks communicating with them from the upper apartments give out their offensive and deadly gas, and pollute the air of the whole neighborhood. One of the provisions of a law regulating these matters should be directed against permitting an underground apartment of any description to be rented or used as a tenement.

It would be an unnecessary encroachment upon your time, to present in detail the numerous suggestions made by practical builders, and by the police and health officers of New York, who appeared before your Committee, in reference to the best mode of effecting the much desired reform in the construction and management of tenement houses, with a view to removing the evils resulting from their present filthy and dangerous condition. It is sufficient to say, that in every instance they concurred in recommending legislative action at the earliest possible moment, and that they were unanimous in the opinion that only through the interference of the Assembly, and the passage of some law regulating the style of tenement buildings, and providing for their management, could the existing evils be properly reached or effectually remedied. In the views of these parties the entire New York press has concurred; for there is not a paper published in the city that has not warmly approved of the objects for the attainment of which the Committee was formed, and urgently recommended a continuance of its powers during the recess of the Legislature, and until some definite plan of reform has been perfected, to be submitted to the next Legislature for action.

The remarks that have been made with reference to the tenement houses in New York apply with equal force to similar buildings in Brooklyn; and attached to this report will be found a statement of the number of houses and of the families occupying them in that city.

The members of the Legislature, very probably desirous of protecting the State against needless expenditures, are in general apt to oppose the extension of a committee's powers after the adjournment; but your Committee would be remiss in their duty, did they fail to urge upon you honorable body the necessity that exists for such action in the present instance. That the evils complained of in reality exist, no person will deny; that they need the interference of the Legislature for their removal, all will admit. If the matter should be now ended for the present year, the expenditure that has been thus far incurred would be comparatively wasted; and the

Legislature would doubtless appoint a new committee, who would be compelled to commence the work anew, and would in all probability be unable to accomplish any result during the brief space of time they would be able to devote to the subject during the session. The expense that would attend the probably fruitless labors of a new committee, appointed next year, would suffice to enable the present Committee, during the recess, to make a thorough investigation of the matter, to mature a well considered plan of reform, and to prepare a bill upon which the succeeding Legislature will be able to act.

Indeed, no expenditure that could be incurred in securing the removal of the evils complained of, could be at all commensurate with the benefits and the saving that would result therefrom. To the wretched condition of the dwellings of the poor of New York, can be traced an enormous proportion of the burdens imposed upon the property-holders of the city, and upon the State at large, for the support of paupers and criminals. From the foul atmosphere of the tenement houses spring the infectious diseases that so frequently spread through the city, sweeping away their thousands of victims, and not confining their depredations to the class with which they originate, but penetrating into the localities occupied by the wealthy, and rendering desolate many a happy household. Hundreds upon hundreds of paupers pour into the hospitals, stricken by disease contracted in those hotbeds of pestilence, the tenement houses. From them, drunkenness mainly receives its victims; for what will sooner drive man to the intoxicating cup than an absence of all attraction and all comfort from his home? From them, the brothels of the city are peopled; for there the female is early taught to forget all womanly feeling and inured to a life of shame. From them, the jails are supplied; for they are the natural haunt of felons. It is no idle assertion to say that a reform by which the condition of the homes of the poor could be improved would remove a large proportion of the criminals from our prisons and the paupers from our almshouses. In London, since the model lodging-houses have been in existence, together with baths and wash-houses for the poor, the mortality has decreased 31 per cent., and pauperism 39 per cent. A similar result would attend a similar reform in New York.

The practical results which your Committee will endeavor to secure through legislative action, and to which their inquiries will be directed, are—

Ventilation and cleanliness in tenement houses—so that the public health may be protected, the spread of infectious diseases checked, and the expenses of public hospitals and almshouses decreased.

An enactment against permitting the renting of underground apartments, or cellars, as tenements.

Regulations as to the building of halls and stairways in houses occupied by more than three families, so as to insure easy egress in case of fire.

The prevention of prostitution and incest, by providing that only a sufficient number of rooms, or a room properly divided into separate departments, shall be rented to families, and by prohibiting sub-letting.

The prevention of drunkenness, by providing to every man a clean and comfortable home.

In conclusion, your Committee would state, that as they are all residents of New York or its immediate neighborhood, the expenses attending their labors during the recess would be comparatively trifling, and they therefore beg respectfully to submit for the consideration of the House the following resolution:—

Resolved, That the Special Committee appointed to examine into the condition of the tenement houses in New York and Brooklyn, have power to extend their operations during the recess of the Legislature, so far as is necessary to enable them to perfect some plan of reform, and to prepare a bill for the consideration of the next House of Assembly, and that they be required to present their report and bill to the next Legislature some time during the first week of January, 1857.

JOHN M. REED,
ELI CURTIS,
WILLIAM J. SHEA,
SAMUEL BREVOORT,
A. J. H. DUGANNE.

Report of Tenant Houses in the City of Brooklyn, with the Number of Families in each.

Ward.	No. of houses.				Families.	Average No. of persons in each family.
1	50,	of which 11	contain each	. . . . .	5	4
		" 14	"	. . . . .	6	
		" 8	"	. . . . .	7	
		" 7	"	. . . . .	8	

Ward.	No. of houses.				Families.	Average No. of persons in each family.
1	50,	of which	5	contain each	9	
		"	4	"	10	
		"	1	"	14	
2	59,	"	2	"	4	4 is the average to each family in the ward.
		"	20	"	5	
		"	18	"	6	
		"	11	"	7	
		"	4	"	8	
		"	1	"	9	
		"	1	"	11	
		"	2	"	12	
3	5,	"	1	"	5	3
		"	2	"	6	3
		"	1	"	7	4
		"	1	"	9	4
4	19,	"	4	"	5	4
		"	8	"	6	4
		"	2	"	7	3
		"	4	"	8	4
		"	1	"	10	4
5	115,	"	35	"	5	4 persons in each family is the average of the ward.
		"	32	"	6	
		"	29	"	7	
		"	11	"	8	
		"	3	"	9	
		"	2	"	10	
						Remarks.
		"	1	"	12	14 rooms, each 10 by 12; 49 persons.
		"	1	"	15	18 rooms, each 10 by 12; 72 persons.
		"	1	"	16	16 rooms, each 10 by 12; 69 persons.
6	99,	"	17	"	5	
		"	24	"	6	
		"	21	"	7	
		"	12	"	8	
		"	6	"	9	
		"	11	"	11	
		"	2	"	14	1, 25 by 40 ft., 4 story; 1, 35 by 38 ft., 3 story.
		"	1	"	15	100 by 100 ft., 4 story.
		"	2	"	16	25 by 40 ft., 4 story.
		"	2	"	20	Brick, 25 by 50 ft., 1 ent.
		"	1	"	21	Brick, 24 by 40 ft., 1 ent.
		"	1	"	30	Brick, 30 by 50 ft., 1 ent.
		"	1	"	32	Brick, 80 by 36 ft., 4 ents.
		"	1	"	36	Brick, 88 by 38 ft., 2 ents.

Ward.	No. of houses.				Families.	Average No. of persons in each family.	
7	29,	of which 11	contain each	. . . . .	4	5	
		" 6	"	. . . . .	6	5	
		" 7	"	. . . . .	7	3	
		" 2	"	. . . . .	9	4	
		" 3	"	. . . . .	8	4	
8	6,	" 4	"	. . . . .	5	3	
		" 1	"	. . . . .	10	4	
		" 1	"	. . . . .	20	4	
9	6,	" 4	"	. . . . .	4	4	
		" 1	"	. . . . .	5	3	
		" 1	"	. . . . .	6	4	
10	81,	" 19	"	. . . . .	5		
		" 25	"	. . . . .	6		
		" 16	"	. . . . .	7		
		" 12	"	. . . . .	8		
		" 4	"	. . . . .	9		
		" 2	"	. . . . .	10		
		" 1	"	. . . . .	12		
		" 1	"	. . . . .	17		
		" 1	"	. . . . .	18		
11	25,	" 3	"	. . . . .	4	4	
		" 6	"	. . . . .	5	4	
		" 7	"	. . . . .	6	4	
		" 6	"	. . . . .	8	4	
		" 1	"	. . . . .	10	4	
		" 1	"	. . . . .	12	4	
		" 1	"	. . . . .	16	4	
12	40,	" 21	"	. . . . .	5		
		" 13	"	. . . . .	6		
		" 2	"	. . . . .	7		
		" 2	"	. . . . .	8		
		" 1	"	. . . . .	12		
		" 1	"	. . . . .	20	(20 by 40 ft., 3 stories.)	
13	39,	" 7	"	. . . . .	6		
		" 8	"	. . . . .	7		
		" 12	"	. . . . .	8		
		" 4	"	. . . . .	11		
		" 4	"	. . . . .	16		
		" 4	"	. . . . .	20		
14	66,	" 18	"	. . . . .	5		
		" 29	"	. . . . .	6		
		" 9	"	. . . . .	7		
		" 7	"	. . . . .	8		
		" 1	"	. . . . .	10		
		" 1	"	. . . . .	12		
		" 1	"	. . . . .	18		
17	10,	" 2	"	. . . . .	5		
		" 5	"	. . . . .	6		
		" 3	"	. . . . .	7		

REPORT

ON

TREATMENT OF CHOLERA INFANTUM.

BY

A. J. FULLER.

REPORT ON TREATMENT OF CHOLERA INFANTUM.

HAVING been selected by this Association to present an essay on the best treatment of Cholera Infantum, I enter upon the duty with distrust as to my ability to offer anything new or interesting on this grand exterminator of our infantile population. It would seem that this disease has been overlooked, or given the go-by, more than any other disease that is as prevalent, or that proves so destructive to our race. Its real pathology seems to be but imperfectly understood, and consequently the treatment must be left in great doubt. Some few able dissertations have been written, and useful suggestions laid before the profession, which, if improved upon by the profession, might at the present time enable the practitioner to have a comparative control of this desolater of our infant population. It would seem that in the extraordinary efforts that are made to combat disease in the adult portion of our race, that the profession had in a measure forgotten that they were once children themselves, but rather, to imagine that they were ushered upon the great platform of human existence at a season long after they had to contend with the various maladies which the period of childhood is subjected too. I do not wish to be understood as laying this charge to the door of all my professional brethren; for there are honorable exceptions, men who have devoted much of their time in a long and active practice to investigating this disease, and perfecting a treatment that would in a measure arrest the progress of this vast exterminator of our race. It is difficult to account for so much being written every year on disease of much less fatality, and that so little mention is made of cholera infantum in Europe, or America. It cannot be possible, but that thousands of cases occur in both countries during each and every warm season; and if it has proved as great an annoyance to them as it has to me, I am surprised to see such apathy of inquiry on the part of the profession,

as to what is the best mode of treatment in cholera infantum. I hope my professional brethren will excuse my earnest appeals, for I have but one object in view, and that is that this disease may be more generally investigated by the profession, change and interchange of opinions be made, that will enable us to carry joy and comfort to many a heart-stricken parent, who may be called to see the *idol* of his heart wasting away under this canker-worm of destruction, that is undermining their prospects of future happiness. As I was not assigned the pathology of this disease, I shall not be expected to enter into a discussion of that subject any further than to base the rationale of my treatment.

Cholera, which literally signifies a flow of bile, has been misapplied in designating this disease, and is calculated to mislead by the false pathology from which the term was originally derived. Dr. James Johnson, in his excellent work on the influence of tropical climates on European constitutions, has exposed in the following remarks, the vulgar belief which I fear still pervades the medical profession, that the disease is produced by an inordinate secretion and discharge of bile: "In no disease has a symptom passed for a cause with more currency, and less doubt, than in cholera. He says from Hippocrates to Celsus, and from Celsus to Saunders, and I might add from Saunders to the present day, *bile* has been considered, without a hearing, as the original perpetrator of all the mischief. Yet he says, I venture to affirm that cholera does not depend on an increase, but on a diminution, and in many cases a total suppression of the biliary secretion"—p. 234.

Although Celsus borrowed the word cholera from the Greek physicians, he evidently considered the disease to be located in the stomach and bowels, and merely stated that this appellation was adopted from the flow at first of limpid, or white, and afterwards black, and various other discharges accompanying it, which the ancients supposed to be biliary. When children are attacked with cholera infantum, so far as my observation goes, the first discharges from the stomach and bowels consist of their natural contents. These are followed by serum, or a limpid fluid resembling thin gruel; and when the vomiting has continued some time, the evacuations consist in part of bile, the color being either dark green or quite black. Hence it appears to me obvious that the appearance of bile in the fluids ejected from the stomach and bowels is only the effect of mechanical compression on the biliary reservoirs, and produced solely by the violent contractions of the abdominal

muscles during the act of vomiting. In very severe cases we often have alarming collapse follow every paroxysm of pain, vomiting, or purging: the deathlike appearance of the little patient excites the greatest anxiety on the part of physician and friends; the pulse becomes slow and imperceptible, the extremities cold, the countenance pale and contracted, and a state of great nervous exhaustion soon follows, resembling in all respects a dying condition, and not seldom terminates speedily in death. The seat of cholera infantum is evidently in the mucous membrane of the alimentary canal. I do not consider the affection of this membrane as necessarily a primary disease in all cases; it may depend for its existence on some other organ. The circumstances under which it occurs, and the peculiar modifications which give it a distinctive character, will enable us to obtain some knowledge of its real character. The conditions necessary to the formation of cholera infantum appear clearly to be high atmospheric temperature, a vitiated air, and the period of primary dentition. Neither one of these causes, nor do any two of them appear to be at all times sufficient to produce this disease; for it does not often occur in the pure air of the country, nor does it prevail in densely populated cities, except in summer; neither does it affect children at any other time of life than during the process of teething. Dr. Eberle observes that it seldom shows itself before the third month or after the second year; though I am sure that I have seen well-marked cases at a later period. I believe the liver to have an important agency in the formation of this disease, or at least that it is materially connected with it; this is very evident from the great size, the dense and altered structure it acquires, as has been revealed in those cases that have been examined after death. Dr. Horner, in his *Pathological Anatomy*, says that "the liver in cholera infantum is very much enlarged, occupying two-thirds of the abdominal cavity." Dr. Dewees corroborates this statement, and I would here say that, in every case of which I have had an autopsy, with one exception such has uniformly been the case. This condition of the liver is more strongly marked in those cases of long standing, and it is also attended with a manifest firmness of structure. I believe this condition of the liver to be connected with a suspension of its secretions to a greater or less degree. We have the putrid and acrid smell of feces which goes far to substantiate this fact; for, according to experiments already made by Tiedemann and Gmelin, the bile tends to prevent the putrefaction of food during its passage through the intestines, for when prevented from flowing into them their contents

seem more rapidly to decay than in a healthy state. It is also evident from the fact that there is no abatement of the symptoms until the liver has resumed its functions.

Dr. Eberle also remarks: "So long as the liver remains inactive, and the alvine discharges free from bile, the disease may be regarded as still possessing all its violent and dangerous tendency, whatever abatement may occur in the severity of vomiting and purging."

Finding, as we do, this state of liver in cholera infantum, and knowing that atmospheric heat will produce an irritated condition of this organ, and as this is one of the essential causes of the disease in question, it is very natural to suppose that the liver may have some agency in the production of this disease through the medium of the portal circulation. Again, this disease is not prevalent except in vitiated air; and as marsh malaria will cause disease of the liver, what tangible reason is there for not believing that the malaria of cities may, when united with other causes, produce similar affections of this gland? for I believe the effect of malaria is produced through the agency of that part of the system which is more immediately connected with the air that is in the lungs; and its action arises either from some deficiency of oxygen in the air respired, or from some paralyzing influence it possesses. I conclude from the preceding inquiries that the whole abdominal viscera are more or less implicated in cholera infantum. The dissections of Drs. Horner and Billard would seem to lead to this conclusion. "M. Billard has demonstrated by numerous dissections that at the time of dentition there is a general development of all parts immediately connected with digestion, and that the follicular apparatus of the stomach and intestines is in a state of excitement, and undergoes a remarkable change with the eruption of the first teeth, secreting an abundance of mucus, either to assist in the assimilation of the new kind of food which the infant will soon require, or to protect the mucous membrane of the intestines from the irritation to which it will thereby become exposed." From the fact of the occurrence of the disease at the time of teething, when the muciparous glands are in a state of great functional excitability, it appears evident that cholera infantum is a disease seated in the mucous follicles of the intestines; and that the hepatic congestion is necessarily connected with it; the disease of the follicles being a secondary affection, caused by the congested state of the liver, by which a free passage of blood is prevented. The natural excessive action of these

follicles at the time of dentition, places them in a condition to take on diseased action from any cause which would produce congestion in them; it is from this fact that the disease is fixed to this apparatus alone, while other parts of the viscera being less predisposed escape from the effects of congestion.

In addition to the foregoing characteristic symptoms, there exists also in most cases a remarkable heat about the head throughout the whole of this disease; this undoubtedly is owing to the great tendency at this age to cerebral irritation, from the quantity of blood circulating in that organ during the period of dentition; and we often find this a very troublesome symptom. The treatment should be mainly directed to the glandular congestion on which the disease depends; for if once a free secretion of bile is obtained, the disease may generally be considered as overcome; the sooner the liver can be brought to resume its secretory action, the greater in general will be the probable ultimate success in our endeavors to arrest the disease. Having thus briefly alluded to what seems to me to constitute the true pathology of this disease, I will now proceed to discuss what appears to be the most rational course of treatment.

TREATMENT.—Provided the physician is called in the early and forming stage of this disease, the most obvious remedy is the abstraction of blood from the right hypochondrium by leeches, and in conjunction with this remedy small doses of calomel seem to be indicated. Judging from my own observation, I believe calomel to be one of the most efficacious means of combating this disease; instead of increasing the irritation of the mucous membrane as some contend, when given in small doses it seems to allay it, and we often have a quiet repose follow its use. I think the utility of calomel is increased by adding small doses of ipecacuanha, more particularly from its usefulness in creating a diaphoretic action; but the tendency to vomiting often forbids its use. When the latter symptom exists to any great degree, a stimulating poultice of mustard or friction with capsicum and camphor will be found of great service when faithfully applied to the stomach and bowels; when there is much acidity of the stomach, I have found it most readily relieved by small doses of bicarbonate of soda or phosphate of lime with equal proportions of prepared charcoal, and this continued every two or four hours until the acidity of the stomach is corrected, and in a majority of cases we find the nausea and vomiting soon to cease. The effervescing draught is often very useful for the same purpose. But unfortunately the physician is not called in this stage, but more

generally we find the little patient in a stage of collapse; then the warm bath is a most useful adjunct to the usual remedies in this stage of the disease, and should on no account be neglected. If rendered somewhat stimulating by the addition of mustard or the aromatic spirits of ammonia, it will be found to very much increase its utility. Friction over the surface of the body is not only grateful to the little patient, but of great service in determining to the surface and increasing the capillary circulation. Diffusible stimulants are here required, and the physician must make such selections as the indications of the case require from this class of remedies. When swelling of the bowels or heat about the head is present, I would advise the use of local depletion by leeches; for in such cases they seem to be indicated, and should never be neglected. After all the inflammatory symptoms have somewhat subsided, astringents may be brought to our aid with a fair prospect of success; tannic acid, or acetate of lead may be selected as possessing superior merits among this class of remedies, and when the diarrhœa is attendant on excessive action of the muciparious follicles without inflammation, the aromatic sulphuric acid will in many cases meet the indications better than any other remedy. Mild astringents and tonics will be indicated during convalescence. Of these the physician must make such selections as the condition of the patient seems to indicate. Cleanliness and good air are very necessary requisites at this stage of the disease, and should be most strenuously enjoined on the nurse and friends. The instinctive desire for exciting and stimulating food is very remarkable during convalescence; the little patient will often be seen greedily sucking salt pork, fish, &c. The gratification of this instinct may be cautiously allowed, and generally with obvious relief to all of the symptoms. This eager desire for stimulating food affords a striking illustration of the nature of the disease here taken, and of the inordinate and diseased developments of the parts that are at this time of life undergoing a change for the reception of a new kind of food. While this desire for more nourishing aliment is allowed, often the moderate use of diffusible stimulants is of great utility, in order the better to assist digestion and give tone to the system. In cases of an anemic character, the syrup of iodide of iron, from six to ten drops three times a day, has seemed to improve this condition of the system very materially and hasten the period of returning good health. In this disease, I apprehend, a limited view of its nature may be taken when studied only as it is manifested in one organ, without considering the connection it may have with

others. To the disease we have just been considering this remark applies with more than ordinary force; and the extended view of it, and the consequent treatment adopted in this country, are the result of a vast accumulation of experience obtained where the prevalence of the disease is coextensive with the boundaries of the land, and where its appearance is annually anticipated with the same certainty as that of the season which gives it existence. Those who have recorded this experience on cholera infantum are men who have distinguished themselves in the field of science, and who are unsurpassed in sagacity in ferreting out the pathology of disease, and are possessed of a solid philosophic judgment. I allude to this more particularly on account of some strictures of European authors on the non-success of American practice and prophylactic treatment of cholera infantum. So far as any statistical knowledge or result of their treatment has come under my observation, the American practice will compare favorably with that of our transatlantic brethren in the disease under discussion. I presume those strictures are no more just than similar ones would be if applied to any other disease that baffles the skill of all physicians in all countries, such, for instance, as phthisis or Asiatic cholera as it appears in Europe or America.

A. J. FULLER.

BATH, MAINE.

REPORT

ON THE

USE AND EFFECT OF APPLICATIONS

OF

NITRATE OF SILVER TO THE THROAT,

EITHER IN

LOCAL OR GENERAL DISEASE.

By HORACE GREEN, M. D.

REPORT ON THE USE AND EFFECT

OF

APPLICATIONS OF NITRATE OF SILVER TO THE THROAT EITHER IN LOCAL OR GENERAL DISEASE.

MANY years ago the celebrated Abernethy published to the world his treatise "On the Constitutional Origin of Local Diseases." His views have been pronounced enlightened and philosophical; and perhaps justly so. Certainly they were eminently suggestive, for they contributed, more than those of any other writer of that period, to awaken among both surgeons and physicians a spirit of enlightened inquiry with regard to primary diseased action.

But the great work needed now more than any other, by both branches of the profession, and which might be termed, perhaps, the converse of that of Mr. Abernethy, is one which would embrace a full, enlightened, and philosophical history of the *Local Origin of Constitutional Diseases.* Until this neglected portion of the history of Medicine shall have been written by some second Abernethy, thoroughly enlightened and imbued with the vast importance of his subject, the value of topical medication, its effects and utility, cannot be fully appreciated by the profession.

A brief history, only, of the therapeutic effects of a single agent locally employed in the treatment of disease, is doubtless the one expected by those from whom the appointment to report on this subject emanated; and yet the diseases in which topical medication has been already successfuly employed, embrace a wide range, and include many of the most important affections which the physician is called upon to treat. Besides all that has been written in this country on the topical employment of nitrate of silver, several works of some magnitude, besides many monographs, have been published in Europe within a few years, which are devoted wholly

or in part, to the history of the effects of this therapeutic agent in the treatment of disease. In reporting, therefore, on this subject, I shall refer primarily and mainly to the views and conclusions of others—to those which appear to be based on carefully recorded observations—believing that the value of my own views and opinions will be enhanced when these are sustained by the experience and the corroborative testimony of distinguished observers of my own and of other countries.

Among the works which have been published on topical treatment, or in which the use of nitrate of silver as a local therapeutic agent is discussed, are the following: "*Dysphonia Clericorum, or Clergyman's Sore Throat, its Pathology and Treatment.* By James Mackness, M. D., member of the College of Physicians, London, &c., published in London, 1848." "*A Treatise on Diseases of the Larynx and Trachea, and their Treatment by the Local Application of Caustics.* By John Hastings, M. D., Licentiate of the Royal College of Physicians, London, &c., 1850."

A work on the Medication of the Larynx and Trachea, by S. Scott Allison, M. D., Member of the Royal College of Physicians, London, was published in 1853. And in the same year, Prof. Bennett, of Edinburgh, published his work on Tuberculosis and on the Local Medication of Pharyngeal and Laryngeal Diseases.

But the most comprehensive and valuable publication on this subject, is the recent work of Dr. Watson, of Glasgow, Professor of the Institutes of Medicine in the Andersonian University, in which he declares his object has been to explain the rationale, and to recommend the practice of topical medication to the larynx, not only in those diseases which affect that organ simply and alone, but also in others during the progress of which it is secondarily involved in morbid action.[1]

There are two other foreign works, having reference to diseases of the air-passages and their topical treatment, of which I might speak, both of which were published in London in 1851. The one by a member of the Royal College of Surgeons of England, the other by a Fellow of the Medical Society of London, &c. But as these volumes contain nothing on this subject, not recorded in my own work on *Diseases of the Air-passages*, published in 1846, I shall only allude to them in order to say, that however just the

[1] The Topical Medication of the Larynx in Certain Diseases of the Respiratory and Vocal Organs. By Eben Watson, A. M., M. D. &c. &c.

English may have been in accusing American writers of "pirating" and of borrowing largely from English authors, they are themselves not altogether immaculate in this respect. One of these authors has taken copiously from the above work, without the ordinary acknowledgment; whilst the other has made up a good-looking volume of nearly two hundred pages, on *Diseases of the Mucous Membrane of the Throat and their Treatment by Topical Medication*, a large proportion of which in its chapters on pathology, etiology, and treatment, is abstracted from my work; page after page of matter having been copied literally, without any intimation whatever as to its true paternity, and that too without those revisions and improvements which might have been made advantageously, with almost every sentence purloined.

Although many brief articles on the treatment of several of the diseases of the air-passages by means of cauterization, have from time to time appeared in our Medical Journals, yet no work, not even a monograph, especially devoted to this subject, has ever been published by any one among my own countrymen.

Among the diseases, in the treatment of which the preceding authors have recommended the employment of applications of nitrate of silver, are the following: Follicular disease of the pharyngo-laryngeal mucous membrane, acute and chronic laryngitis, croup, œdema of the glottis, aphonia, hooping-cough, spasmodic asthma, chronic bronchitis, laryngismus, and tuberculosis, especially when the latter affection is consequent on or complicated with laryngeal disease.

Now, the question very appropriately presents itself, on what principle in rational or scientific medicine, is that practice founded by which several diseases, diverse in their indications, can be successfully treated by the employment of a single topical remedy?

Dr. Watson, in his recent valuable work, to which I have alluded, in considering the *modus operandi* of this local stimulant, in the treatment of inflammations of the mucous membrane, offers an interesting rationale of that treatment, showing its applicability to many diseases, which at first sight are essentially different; "as different, for example, as hooping-cough and laryngitis, or as either of these and aphonia."

All practitioners who have used this local remedy to any extent, have found it highly important to vary the strength of the solution in different cases, and also according to the condition of the diseased membrane. When a solution of nitrate of silver of moderate

strength is applied to the mucous membrane, it acts chemically on the mucus with which it comes in contact, and throws down a copious white deposit that coats the membrane beneath.

"In erosion and ulceration of the mucous membrane," says Dr. Watson, "the deposit of the white substance before alluded to, from the caustic solution, is thickened by coagulation of the albumen of the *liquor sanguinis*, which transudes from the exposed vessels, and thus protection is afforded to the delicate and inflamed parts beneath."[1] The therapeutic effect which follows the stimulation produced in the vessels of the parts, by the application of the argentine solution, he explains by a reference to the action of this remedy, on the different degrees and stages of that inflammatory process, which is artificially produced in the web of a frog's foot stretched out under a microscope.

When, for example, he says, "a red-hot needle is passed through the web, the following are the phenomena observed: A spot in the centre of the inflamed part is sphacelated, destroyed by the passage of the needle through it; a circle around the spot is usually found in a state of complete congestion, the vessels being dilated and the corpuscles almost perfectly stationary within them, while in the part beyond this circle, the vessels are not so much dilated, and the stasis of their contents is not so complete. The stream is seen passing slowly away into the collateral circulation of the unaffected parts of the web."

"Now these two circles represent two degrees of inflammation, which it is important to distinguish wherever they occur, and perhaps especially when the seat of morbid action is the mucous membrane of the larynx or trachea. That part of the web of the frog's foot in which the stasis was complete, represents the most intense, or sthenic degree; the other, in which the stasis was not so complete, represents what is usually called the subacute, and perhaps chronic varieties. And the effects of the solution of caustic on each of these parts, is markedly and importantly different. In the part which is most intensely inflamed, the solution in the direct ratio of its strength increases the stasis of the blood within the vessels. The latter seem to be unable to dilate further, and are, therefore, little changed, but the nitrate of silver acts through the coats upon the blood which they contain by causing its partial coagulation, and likewise by withdrawing water from the serum for the crystals of

[1] Op. citat., p. 32.

the nitrate which begin partially to form if the solution is strong. In that part of the web, on the other hand, which had been less intensely inflamed, the stimulant solution causes a renewed and increased dilatation of the bloodvessels, and the retarded current moves on in them more freely than before; a cure being thus speedily effected if the exciting cause of the inflammation has ceased to act."[1]

From these experiments Dr. Watson believes we are warranted in concluding that the purely stimulant action of this remedy is beneficial, in all varieties of the inflammatory process, except the most intense; and that a strong solution not only stimulates the vessels, but tends, as in the different varieties of œdema, to remove the watery part of their contents, on the laws of *exosmose* and *endosmose*.

Prof. Bennett, of Edinburgh, on the other hand, declares in his recent work on *Pulmonary Tuberculosis*, that "the action of the nitrate of silver solution is not that of a stimulant, but rather that of a calmative or sedative. It acts chemically on the mucus, pus, or other albuminous fluids it comes in contact with, throws down a copious white precipitate, in the form of a molecular membrane, which defends, for a time, the tender mucous surface, or irritable ulcer, and leaves the passage free for acts of respiration. Hence the feeling of relief almost always occasioned; that diminution of irritation in the parts, which is so favorable to cure, and why it is that strong solutions of the salt are much more efficacious than weak ones."[2]

Dr. Scott Alison, in his work on the *Medication of the Larynx and Trachea*, expresses the opinion that the nitrate of silver, when applied to an acutely inflamed organ, is an irritant, and may aggravate the morbid condition. "To a part affected with chronic inflammation," he says, "it is a tonic and a stimulant, and therefore is likely to be beneficial. To a tissue, the subject of irritation, it is a sedative. Applied to a membrane, which for some time has been the seat of excessive and unhealthy secretion, it abates and corrects it."[3]

[1] Op. citat., pp. 32–3.

[2] The Pathology and Treatment of Pulmonary Tuberculosis; and on the Local Medication of Pharyngeal and Laryngeal Diseases, frequently mistaken for, or associated with, Phthisis. By John Hughes Bennett, M. D., F.R.S.E., &c. &c., p. 140.

[3] The Medication of the Larynx and Trachea. By S. Scott Alison, M.D., &c., pp. 10, 11.

These are the opinions of a few of the distinguished members of the profession—men who have had the largest experience in the use of the remedy—of the therapeutic action of the nitrate of silver solution, in the treatment of diseases of the lining membrane of the air-tubes.

I shall now proceed, in as brief a manner as possible, to specify some of the most important of the local and general diseases which have been enumerated, in the treatment of which, the Use and Effect of Nitrate of Silver have been observed and recorded.

1st. *The Effect of Nitrate of Silver in the Treatment of Follicular Pharyngo-laryngeal Disease.*

In advocating the employment of topical medication, in the treatment of diseases of the air-passages, in the work to which I have alluded, I state that, "in the simple and uncomplicated form of follicular pharyngo-laryngeal disease, however severe the local affection may have been, this remedy alone, namely, the crystals of nitrate of silver topically applied, has proved in my hands a specific in a large number of cases."[1]

This opinion of the efficacy of the remedy in this disease, has been fully sustained by subsequent experience, in the practice of many distinguished physicians in this and in other countries. It is well known that Prof. Bennett, of the University of Edinburgh, has adopted extensively topical medication in the treatment of laryngeal and kindred diseases, in the Royal Infirmary, and in his private practice.

In his treatise on *Pulmonary Tuberculosis and Laryngeal Affections*, much valuable information on this subject, and many interesting cases, successfully treated by the applications of nitrate of silver, are given. I shall take the liberty of noting the following

CASE.—"I was requested by an assurance office, in July, 1850, to examine the chest of Mr. M——, a merchant, aged about 30, who said he labored under no kind of complaint, with the exception of occasional sore throat, and expectoration of mucus tinged with blood. He was tolerably stout, took long walks without uneasiness, and suffered from no difficulty of respiration or from cough. Repeated examination of his chest failed to elicit any physical sign indicative of pulmonary disease. I therefore certified that his lungs were healthy. In October, 1851, this gentleman called upon me again for advice, under the following circumstances. The sore-

[1] A Treatise on Diseases of the Air-Passages, &c., p. 213.

ness of the throat had latterly increased, and considerable cough was induced, after which he spat up mouthfuls of purulent matter, frequently tinged of a red color. He brought me some of this sputum to examine, which consisted of mixed blood and pus, of a dirty brick-red color. Examination of his chest again convinced me that the lungs were unaffected; but in the interval I had paid attention to the writings and practice of Dr. Horace Green, of New York; and I now examined his throat, when the cause of his symptoms was at once apparent. The fauces and upper part of the pharynx were studded over with nodular swellings, varying in size from a pin head to that of a pea. Many of them were bright red, and fungoid in character, probably the origin of the extravasated blood, whilst considerable patches of purulent matter adhered to several parts of the mucous membrane. I applied a sponge, saturated with a strong solution of the nitrate of silver, to the affected parts. In three days he returned, having been much relieved, when the application was repeated. I have not seen him since.

"These two cases (a second case being recorded by Dr. B., not quoted) convinced me that certain symptoms which have hitherto been considered as indicative of phthisis, might have their origin entirely in the fauces, pharynx, and upper part of the larynx. The cough, so occasioned, with the purulent expectoration, often tinged with blood, frequently so resembles that occasioned by phthisis, as not only to induce alarm in the minds of the patients, but frequently to mislead the medical practitioner. I have now met with many such cases, which have been mistaken for phthisis, and which have been treated for that disease without any effect, until local remedies were applied, when they, for the most part, disappeared or became much better."[1]

Dr. Bennett enumerates other cases of follicular disease, where all the symptoms of phthisis pulmonalis were present, including emaciation, profuse sweating, cough, expectoration of pus mingled with blood, bad appetite, hectic; and, in consequence, cod-liver oil, cough mixtures, acid drops, wine and good diet were administered, and all without effect; "but which in many instances were cured by the topical applications."

2d. *The Effect of Nitrate of Silver in the Treatment of Acute and Chronic Laryngitis.*

Dr. Hastings, in his excellent *Treatise on Diseases of the Larynx*

[1] Op. citat., p. 128.

and Trachea, expresses great confidence in the use of the Nitrate of Silver, as a local remedy in the treatment of these affections; and he also details many cases of much interest, in which topical medication proved effectual in arresting the disease, after other measures had failed. Under the head of "Follicular Laryngitis," Dr. Hastings alludes to a pathological condition of the larynx and trachea, which, as an independent affection, is very generally overlooked by the profession, or, is considered the sequel—not, as it often is, the antecedent of tuberculosis. "I am satisfied," says Dr. Hastings, "that cases presenting the morbid appearances in the pharynx and arch of the fauces just described, form but a small proportion of those denominated follicular laryngitis."[1] * * * *

"I have repeatedly met with cases in which the disease was confined to those parts, and the back of the velum, where nothing more was required than to carry the solution of the nitrate of silver behind the uvula into the posterior nares, and over the pharynx and fauces, in order to remove a very troublesome cough; whilst in others, and by far the greater number, the disease exists in the larynx and trachea, the fauces and pharynx at the same time presenting a healthy appearance.

"Such cases are, generally, most puzzling to the practitioner. The patient is troubled with cough, the expectoration is muco-purulent, occasionally streaked with blood, to a considerable amount; pains are felt in the chest below the clavicles, he wastes a little, or he may not lose flesh. His chest is examined again and again, but no disease can be discovered; his mouth and throat are inspected without anything being found there to account for the symptoms; at length the disease is regarded as an obscure case of phthisis; he gets treated with sedatives, expectorants, and cod-liver oil, until the ensuing winter, when all his former symptoms return in an aggravated degree, whilst as the warm season comes on, they improve."

"Much pain and suffering might be spared in these cases, were a stethoscopic examination of the windpipe resorted to, which in most cases would point out the nature, situation, and extent of the disease; and the practitioner would have that satisfaction in treating the case, which an imperfect knowledge, or an entire ignorance of it can never give."[2]

[1] A Treatise on Diseases of the Larynx and Trachea. By John Hastings, M.D., &c. London, pp. 115.

[2] Op. citat., pp. 116–7.

Such cases are reported by Dr. Hastings as having been successfully treated by the repeated application of the sponge, saturated with a solution of the nitrate of silver, and which was "carried down the windpipe," he says, "as low as the bifurcation of the bronchi."[1]

In speaking of the practicability of this operation, and of the benefit to be derived from topical medication in disease of the larynx, Prof. Bennett declares, that if the probang be properly prepared, and the operation well performed, the sponge saturated with the solution of nitrate of silver may be rapidly thrust through the rima into the larynx and frequently into the trachea. "I am persuaded," he continues, "that on many occasions, I have passed it pretty deep into the trachea, not only from the length of the probang which has disappeared, but also from the sensations of the patient.[2] * * * In this first part of the operation, the rima glottidis is, as it were, taken by surprise, and the sponge enters, if the right direction be given to it, without difficulty; the rima glottidis immediately contracts by reflex action, so that on withdrawing the instrument you feel the contraction."

"This also squeezes out the solution, which is diffused over the laryngeal and tracheal mucous membrane. Now if the sponge be a fine one, it will be found capable of holding about half a drachm of fluid, the effect of which upon the secretions and mucous surfaces, almost always produces temporary relief to the symptoms, and strengthens the tone of the voice; results at once apparent after the momentary spasm has abated."

In the treatment of both varieties of chronic laryngitis, the idiopathic and the tubercular, topical applications of the nitrate of silver solution have proved, in the hands of many practitioners, a most efficient and valuable remedy.

Dr. Cotton, one of the physicians of Brompton Hospital, in the work to which I have alluded, in speaking of topical medication in chronic laryngitis and laryngeal phthisis, candidly admits his previous unbelief in, and changed views with regard to the practicability or propriety of topical medication to the mucous membrane of the respiratory passages. The admission is honorable to himself, and worthy of imitation. "I should here remark," he observes, "that my own views upon this subject differ from those I formerly held and have even expressed; and that I owe this change to the

[1] Op. citat., p. 119. [2] Ib., pp. 139, 140.

kindness of Dr. Horace Green, of New York, the justly celebrated advocate of this treatment, who, during a recent visit to our metropolis, convinced myself and others, not only of the possibility, but of the safety and usefulness of the practice.

"I had long been in the habit of using a solution of nitrate of silver to the pharynx and upper surface of the epiglottis, by means of a soft brush, in all the early cases, both of pharyngeal and laryngeal complication; and had frequently witnessed its good effects, not only upon the part to which it was immediately applied, but upon the laryngeal structures also, attributing it in the latter case to an action excited in the upper respiratory passages from continuity. But I had never ventured to apply anything directly to the larynx itself; not from misgivings as to its effects, but from apprehensions of its danger. For some months past, however, I have done so, extensively in cases of chronic laryngitis, whether idiopathic or tubercular, and very frequently with marked success.

"At the commencement of the laryngeal symptoms, a solution of the crystals of nitrate of silver, varying in strength from ten grains to half a drachm to the ounce of distilled water, passed by means of the instrument recommended by Dr. Green, into the opening of the larynx, is often productive of great relief. I have known the voice regained, the irritable cough removed, and the tenderness and difficulty of swallowing dissipated entirely by it; indeed, I think we might almost speak of its *curative* effects, so far, at least, as the larynx is concerned, in some very early cases."[1]

"In the treatment of acute laryngitis," says Dr. Hastings, "the topical application of a solution of the nitrate of silver may sometimes be employed with great advantage; indeed, unaided, it will not unfrequently remove the disease, but then the patient must be seen sufficiently early.

"If the inflammation has not penetrated into the trachea, but is confined to the larynx, we may safely and successfully venture to employ this topical application; for although a small spot of intense inflammation may be safely and successfully treated in this way, a large surface is irritated by the same means.

"This treatment would not interfere or prevent the use of any additional remedies, such as calomel, opium, aperients, &c." "But it is in the chronic form of laryngitis," Dr. Hastings continues, "that this treatment is remarkably useful. Many such cases improve

[1] Op. citat., pp. 236–7.

rapidly under local treatment applied to the larynx and trachea, which, if neglected for months, or it may be for years, not unfrequently lead to permanent changes."[1]

In this connection Dr. Hastings relates some most interesting cases of chronic laryngitis, attended with hoarseness, cough, emaciation, "expectoration streaked with blood," difficulty of breathing, night-sweats, and most of the ordinary symptoms of phthisis—all of which were promptly and permanently relieved by a solution of nitrate of silver of the ordinary strength applied to the larynx and trachea.[2] With regard to the treatment of *tubercular laryngitis*, Dr. Hastings remarks, "I know of no means so capable of arresting and removing it, as sponging the windpipe with a solution of the nitrate of silver.[3]

In the treatment of the non-exudative variety of chronic laryngitis, Dr. Watson has employed and recommends the application of the nitrate of silver to the inflamed mucous membrane; but he considers that a great amount of discrimination is necessary in the adaptation of the strength of the solution to the severity of the inflammation which may be present; as well as in the preparation for commencing the topical measures. In the severe forms of the affection, he believes that depletion of some kind will at first be necessary to check the violence of the inflammation before the applications of the caustic solution are made to the laryngeal membrane;[4] and with regard to the strength of the remedy employed he maintains, that the more intense the degree of inflammation of the laryngeal lining, the weaker ought to be the solution of the nitrate of silver applied to it.[5]

After the intensity of the primary inflammation has been subdued by appropriate treatment, a stronger solution may be used with advantage. "Its first effect," he continues, "when thus judiciously applied, will be to coagulate the albuminous film upon the surface of the membrane which had been stripped of its epithelium, and to secrete new mucus, and thus the artificial film of coagulated albumen is by and by replaced by a more natural covering, and the surface is lubricated by its appropriate moisture.

"If, then, a renewal of the morbid process could be prevented, a cure would already have been effected, but this is seldom or never the case. The good effects of the topical application wear off in a

[1] Op. citat., pp. 79, 80, 81.
[2] Ib., p. 85 et seq.
[3] Ib., p. 130.
[4] Op. citat., p. 40.
[5] Ib., p. 41.

few hours, and the former abnormal phenomena may even in that time have reappeared in nearly equal severity. The treatment must therefore be continued; the touching of the larynx must be repeated frequently for some days; and indeed, until all the symptoms of laryngitis have completely disappeared."[1]

Many practitioners both in this country and in Europe, differ entirely from Dr. Watson, with regard to the strength of the solution to be employed in the treatment of the different degrees of inflammation of the mucous membrane. The weaker solutions, they believe, those for example of the strength of five, ten, or fifteen grains to the ounce of water, act as a stimulant, or as an irritant when applied to a highly inflamed membrane; while a strong solution, by the chemical changes it effects, will prove a sedative, and thus tend directly to subdue the violence of the inflammatory action.

On this point, as we have seen, Prof. Bennett expresses the decided opinion after much observation and experience in the topical use of the nitrate of silver solution, in the treatment of inflammations of the lining membrane of the larynx and trachea, that strong solutions of the salt, by acting as a calmative or sedative, diminish the irritability of the inflamed parts, and are therefore much more efficacious than weak ones.[2]

Dr. Watson, in his treatise, has devoted many pages to the consideration of chronic laryngitis. "In the treatment of chronic disease of the laryngeal mucous membrane," he remarks, "I place my chief reliance on topical applications to the parts affected, but I do not undervalue or neglect more general measures." The strength of the solution, he adds, "should vary with the requirements of the case, and it should be applied every day, or every second day, according to the patient's feelings."[3]

Dr. Alison, in the work to which I have referred, on the *Medication of the Larynx and Trachea*, details his experience in the employment of other agents beside nitrate of silver, for the treatment of local diseases; such as Atrophine, Daturine, Iodine, &c., but he gives the preference to the first named remedy, as the one most efficient. "I had so frequently found," he remarks, "in the treatment of local disease, and local complications, that many remedies were far more efficacious, when applied immediately to the part

[1] Op. citat., p. 41.
[2] Ib., p. 140.
[3] Ib., p. 85 et seq.

affected or to its vicinity, than at a distance, that I was glad to learn that a sponge loaded with the solution of the nitrate of silver, and affixed to a probang, could not only without injury but with manifest advantage be passed through the glottis and the larynx down into the trachea."[1]

In acute inflammation of the glottis, Dr. Alison has hesitated to apply the solution, lest "the presence of the stimulant on parts suffering from such attacks," might aggravate the disease; but in chronic inflammations of the larynx, "and of the upper portion of the trachea, the solution of the nitrate of silver, he observes, has in my hands as in others, been very useful in bringing the disease to a conclusion; and where that has not been accomplished by reason of its dependence upon incurable disease of the lungs, it has almost invariably afforded very considerable relief, by rendering the cough less violent and frequent, and removing much of the tickling and uneasy sensations, at the upper portion of the larynx." * * * * "In some cases of disease of the larynx and trachea," he continues, "in which the symptoms inclined to the suspicion that ulceration existed, the same local application of a solution of the nitrate of silver has been very useful."[2]

Abundant testimony from many other sources might be gathered, if necessary, to prove the great advantage to be obtained from the topical use of this remedy, in the treatment of laryngeal and tracheal disease.

8d. *The Effects of the Application of Nitrate of Silver in the Treatment of Membranous Croup.*

As a difference of opinion obtains, to some extent, among the profession, with regard to the propriety of employing topical applications of the nitrate of silver in *exudative laryngitis*, or croup, I shall examine with some care the opinions and observations of those who have had extensive opportunities to test its efficacy in the treatment of this, often, fatal malady.

According to the testimony furnished by Prof. Trousseau, of Paris, M. Bretonneau, the preceptor of Trousseau, was the first to employ topical medication in the treatment of membranous croup. Prof. Trousseau, in a letter which I received from him, and which was published in the January number of the *American Medical Monthly*, thus writes: "As early as 1818, M. Bretonneau, in the treatment of croup, carried over the aryteno-epiglottic ligaments,

[1] Op. citat., pp. 23.

[2] Ib., pp. 7 and 8.

several times a day, a sponge fastened to the extremity of a piece of whalebone and charged either with pure chlorohydric acid, or with a saturated solution of nitrate of silver. He expressed the fluid from the sponge at the entrance of the larynx, and the patient in the convulsive movements of respiration caused a certain quantity of the caustic solution to enter therein."[1]

In 1830, M. Trousseau employed for the first time caustic applications in the treatment of disease of the larynx. "I made use," says M. Trousseau, "precisely of the same process which I have pointed out above, in the treatment of croup, and I endeavored to express the caustic solution into the cavity of the larynx." In this connection Prof. Trousseau asserts, "that never, either before or since the publication of your labors, have I attempted to introduce into the larynx or trachea, a sponge saturated with a caustic solution," * * * "and consequently," he continues, "the direct introduction of the sponge saturated with a caustic solution, into the larynx and into the bronchial tubes, does not belong to me in any respect whatever."[2]

This local agent has also been employed after the manner of Bretonneau, in the treatment of pseudo-membranous croup, by MM. Dupuytren, Guersant, Guiet, Bouchut, Berton, and other French practitioners, but no one of the number made any attempt to pass the sponge probang into the larynx.

M. Bouchut, whose work on *Diseases of Children* was published in 1845, advises the employment of cauterizations, in the treatment of the disease, but he observes and recommends great caution in making the applications to the pharynx, and over the glottis, lest too large a quantity of the fluid *should drop into the larynx, and produce suffocation and death*, or at least render it necessary to practice immediate tracheotomy. The following are M. Bouchut's remarks on this subject: "Si la cauterization de l'arrére—bouche et de la partie supérieure du larynx est avantageuse, elle a aussi ses inconvénients qu'il faut connaître pour tacher de les éviter. La suffocation immediate peut en être la consequence, si l'on a laissé trop long temps l'éponge sur la glotte, et si une trop grande quantité de liquide a pénétré dans la larynx. Cet accident est fort grave, car il peut déterminer la mort, ou au moins la nécessité de pratiquer aussitôt la trachéotomie."[3]

[1] American Medical Monthly, Jan. 1855, p. 9.

[2] See American Med. Monthly, pp. 9–10.

[3] Manuel Pratique des Maladies des Nouveaux-Nés, et des Enfants à la Mamelle, p. 272.

A late number of the *Archives Générales de Médecine* contains an interesting Memoir, by M. Vauthier, on the history of Croup, as it occurred in an epidemic form, in *L'Hôpital des Enfants Malades de Paris.* In this paper are the details of several well marked cases of membranous croup, which were treated successfully by "emetics and cauterizations;" and although in these instances, the argentine solution was not conveyed into the larynx, but was applied only to the fauces and pharynx, yet the patients recovered perfectly under the treatment.[1] Although the cases thus treated are characterized as having been very severe—"trés intense"—yet, as the treatment was early adopted, it is probable that the exudative process had not extended into the larynx; for, in the same paper is a history given, of five other cases of membranous croup, in which the disease, having reached the larynx, was not arrested by cauterizations. This method was employed, as in the other cases, but no attempt was made to pass the instrument below the epiglottis. Tracheotomy, however, was resorted to in all these five cases, but every patient died. Efficient cauterization of the larynx, we maintain, would have saved three, if not more of these last cases.

Among the English practitioners, of whose works, on topical medication, we have spoken, a few only appear to have employed this remedy in the treatment of true exudative croup. Dr. Watson's experience, in the treatment of the few cases he has reported in his work, has led him to the conclusion, "that the topical treatment is unsuitable during the acute stage of exudative croup."

Having been unsuccessful in the management of a single case of membranous croup,[2] in which he employed the treatment through the acute or inflammatory stage of the disease, Dr. Watson adopts and promulgates the above opinion. In the commencement of the disease, or in that stage of the affection denominated by him "the pre-exudative stage of croup," Dr. Watson highly recommends

[1] Archives Générales de Médecine, tome xix., art. 1st.

[2] The only other case mentioned by Dr. Watson, as one not benefited by the topical treatment, is that of a gentleman past the middle period of life, "who on a winter evening," was suddenly seized with difficult respiration, tightness in the throat, harsh, dry, whistling cough, and high fever, "whilst the physical signs were: Inspiration long in the trachea, and accompanied by a harsh sound of the air passing along the dry and narrowed tube." Symptoms, manifestly indicative of *acute laryngitis*, and not as Dr. Watson supposed, of "ACUTE TRACHEAL CROUP, accompanied by exudation."*

* Op. citat., p. 51.

the application of the solution of nitrate of silver to the throat and larynx. Omitting the applications during the acute stage of the disease, he renews the topical measures, as soon as the inflammatory process has been subdued by appropriate reducing measures. But his views on this subject will be best understood from the following brief extract from his work: "There is a large class of cases, in which the croup commences by a longer or shorter stage of simple, though severe inflammation of the laryngeal membrane. This inflammation differs in nothing from the most intense degree of catarrh, formerly described; but it speedily ends either in exudation upon the surface of the membrane, or in serous effusion beneath it.

"The suddenness of the attack, the anxiety of the patient, the severity of the constitutional fever, and above all, the stethoscopic signs of a dry and tense glottis, never fairly released at any stage of respiration, are the chief diagnostic marks of the danger to be expected in the next stage of the disease. No one who has ever listened attentively to the peculiarly harsh sounds transmitted through the stethoscope placed over the thyroid cartilage of a patient in the critical state we are now considering, can either forget or mistake the prolonged and dry, but vibratory sound during inspiration, immediately followed by the less noisy, though still grating murmur of obstructed expiration by which it is characterized. Then the stifling and painful cough, without expectoration, and the whispering, not hoarse voice, are equally characteristic.

"In children, or in adults predisposed to the disease, such a group of symptoms as that just referred to, may be considered as certainly indicative of the first stage of exudative croup. But no exudation has yet been poured out, and, according to my experience, the disease may here be checked by the application of an appropriately strong solution of the nitrate of silver; and I will venture to assert, it is in the treatment of this pre-exudative stage of croup, if I may be allowed so to name it, for sake of brevity, that Dr. Horace Green has also been successful." [1]

This abortive treatment of croup by topical applications, is further illustrated by Dr. Watson, in his relation of the subjoined case: "It is that of a family of young children," he says, "all of whom are remarkably subject to croup, and, notwithstanding the utmost care in their management, some of them have suffered once

[1] Op. citat., pp. 49, 50.

or twice from the disease during the winter, for some years past. In the beginning of the present year, I attended two of them, and, within the last few days, a third, when attacked by this disagreeable visitant.

"Whenever a croupy cough is heard in this family, the throat and larynx are at once touched with the solution of caustic. A warm bath, a few drops of antimonial wine, and, if necessary, a dose of laxative medicine, are next had recourse to, and very little else is generally required. The throat is touched for the two or three succeeding days, by which time the child is usually quite well.

"Only once that I remember did this abortive treatment fail in my hands, and it was in the case of a member of the family here referred to. The weather was at the time very severe, and the subject of the disease, a strong little boy about six years of age. For some reason or other, it was longer than usual, too, before the topical application was made to the larynx, and it failed. Exudation was thrown out, and the boy passed through a critical illness, during the intensity of which I laid aside the topical treatment, and employed leeches, calomel, and antimony. But when, as happily occurred in this case, the exudation had separated in due time, I renewed the stimulant applications to the windpipe, with marked benefit, and the child made a speedy and perfect recovery."[1]

In one other respect Dr. Watson differs from most practitioners in this country, namely, in the strength of the solution which he employs in the treatment of croup. He has found in practice, he says, that a solution "of fifteen or twenty grains to the ounce of water, is abundantly successful in fulfilling the indications of the disease."[2]

Although a prejudice against the local treatment is still entertained by many practitioners, applications of the nitrate of silver in the treatment of membranous croup have been employed, with more or less success, by physicians in every part of this country. Contributions from the profession have been made from time to time to most of our medical journals, during the last ten years, in which cases successfully treated by this agent are detailed. I will refer only to the opinion and observations of one of these writers; a distinguished permanent member of this Association; it is well known to the reading members of the profession, that several

[1] Op. citat., pp. 51, 52.

[2] Ib., p. 51.

years ago, Dr. Ware, of Boston, published his contributions to the "History and Diagnosis of Croup"—a work evincing more scientific research, and containing more information with regard to the true pathology of membranous croup, than all that had previously been written in America. In these papers, Dr. Ware refers to thirty-nine cases of what he denominates membranous croup, which were noticed in his own, or in the practice of his friends. Of these cases the state of the fauces was observed in thirty-three instances, and "in thirty-two, a false membrane was present; most frequently, and sometimes only, on the tonsils, sometimes on other parts also, as the palate, uvula, and pharynx. In one case no such membrane was present; but it was found to exist in the larynx after death. These thirty-three cases were treated by the ordinary therapeutic measures; and of the whole number *three* only recovered; in thirty the disease proved fatal." It is not at all surprising that, under these circumstances, Dr. Ware, eminent for his careful investigation and conscientious inquiry after truth, should have become "confirmed in the opinion," as he subsequently declares himself to have been, "that the methods of treating this disease, in common use, require a careful reconsideration;" nor, that he should have propounded the question: "If the mode of treating croup commonly adopted, does no good, are we sure that it does no hurt?"

Having concluded after the experience to which we have referred, to treat the disease "without the persevering use of the heroic remedies," Dr. Ware subsequently adopted a method in which the treatment consisted—

1. "In the absence of all reducing, depleting, and disturbing remedies.

2. "Keeping the patient under the full influence of opium combined with calomel.

3. "Constant external application of warmth and moisture (to the neck), and of mercurial liniment, slightly stimulating.

4. "Constant inhalation of watery vapor."

In March, 1850, Dr. Ware read before the Suffolk District Medical Society "*Additional Remarks on the Treatment of Croup*," in which paper he refers to five cases of membranous croup, three of which were treated on the method indicated in the preceding propositions; and in the other two cases, in addition to these general measures, applications of a solution of nitrate of silver were made into the larynx. The first three cases which received general treatment only, proved fatal; yet they "exhibited," says Dr. Ware, "certain

differences from the common course of this disease which indicated a favorable influence from difference of treatment."

"In all of them the membrane was thrown up in considerable quantities.

"In all of them the disease was attended by very much less distress than is usual in croup; and, in two, there was so decided a mitigation of symptoms following the separation of the membrane, as to lead to considerable hope of a favorable termination.

"In two, at least, the disease was prolonged to at least twice its average duration under the usual treatment.

"In the other two cases, to which reference was made, the same general course of treatment was followed, with the addition of the introduction of the sponge, wet with a solution of the nitrate of silver, into the larynx. In each of these cases the application was made as early in the disease as I became satisfied of its distinct character. It was repeated morning and evening. It decidedly gave relief to the breathing, soon after each application, and both cases ultimately recovered perfectly. For the suggestion and adoption of this valuable addition to our means of treating this formidable disease, we are indebted, as is well known, to the enterprise of Dr. Horace Green, of New York. The profession, I think, owe to him a large debt of gratitude, for the energy and perseverance manifested in the introduction of this remedy, and I am the more disposed to render this tribute to him, because so many attempts have been made to detract from his merit in relation to it."

"I am well satisfied from what I have now seen of this method of treating croup, as compared with that which has been followed for so many years, that it has the advantages which were pointed out in one of the preceding papers. It is a disease which I would treat without depletion, except, perhaps, by a few leeches—without vomiting, without purging, without blisters, without antimonials, ipecac., and all those other nauseous remedies which have been usually resorted to. I would trust to opiates, perhaps calomel, emollients, and the local application of the nitrate of silver." "I ought to add that many of my friends in the profession have informed me of cases in their practice, treated on these principles, which have recovered in a favorable manner."[1]

Since the publication of Dr. Ware's papers, cauterization of the larynx, in the treatment of membranous croup, has been adopted by

[1] Boston Med. and Surgical Journal, vol. xlii. pp. 267–8.

large numbers of medical men in New England, as well as in other places in the United States, from many of whom we have received communications on this subject, expressing their full confidence in this therapeutic agent, when timely and appropriately employed in the management of croup.

Should we give the history of a tithe of these cases, which have been thus reported to us, they would occupy a much larger space than can be appropriated to this subject.

In 1848 the chairman of this committee published a small treatise "*On the Pathology of Croup, and its Treatment by Topical Medications*," in which the declaration was made that "the practice of making topical applications of medicinal agents into the larynges of young children, for the treatment of membranous croup, is a plan entirely practicable, safe, and when judiciously employed, *in the highest degree efficacious*." This method of treating a disease hitherto so unmanageable was founded, among others, upon the following propositions (which were then advanced, with regard to the pathology of the disease), namely: "that the essential characteristics of true croup consist in an inflammation of the secreting surfaces of the fauces, larynx, and trachea, which is always productive of a membranaceous or an albuminous exudation."

"2. That the membranaceous concretion, which is found coating the inflamed mucous surface of the parts in croup, is an exudation, not from the membrane itself, but is secreted by the muciparous glands, which so abundantly stud the larynx and trachea.

"3. That the exudative inflammation commences, invariably, in the superior portion of the respiratory passages, and extends from above downwards, never in the opposite direction."[1]

Since the publication of the work in which this mode of treatment is advocated, the author has had the opportunity of treating many cases of croup on the plan deduced from this view of its pathology, viz: by means of topical medication, not only in his own practice, but in the practice of, and in conjunction with, other members of the medical profession; and with an amount of success that has afforded a high degree of encouragement and satisfaction.

He has also received from medical men, in different parts of the United States, as well as from numbers in Europe, the history of many cases of membranous croup, wherein topical measures, in their hands, have proved effectual in arresting the disease.

[1] Observations on the Pathology of Croup, with Remarks on its Treatment by Topical Medications, &c.

4th. *The Effects of the Applications of the Nitrate of Silver in the Treatment of Œdema of the Glottis.*

In 1852, a work "*On the Surgical Treatment of Polypi of the Larynx, and Œdema of the Glottis,*" was published by the author, in which cases of the latter disease are reported as having been successfully treated, as early as 1849, by means of a solution of the nitrate of silver to the affected parts. The happy result which had followed its employment, encouraged the author to commend with much confidence, this method of treating one of the most formidable, and hitherto, one of the most fatal of all the diseases of the larynx.

In a paper read before the Edinburgh Medico-Chirurgical Society, by Dr. John Scott, one of the oldest and most distinguished physicians of Edinburgh—a paper which was afterwards published in the *Monthly Journal of Medical Science* for 1850—many interesting cases of laryngeal diseases, successfully treated by topical treatment, are recorded. Among the cases reported by Dr. Scott is one, the particulars of which were furnished him by his friend, Dr. Brown, of Edinburgh; which appears to have been a case of œdema of the glottis, following, or being complicated with inflammation of the mucous membrane of the parts. The patient was recovering from an attack of erysipelatous sore throat, when Dr. Brown was sent for, the message being that the patient was dying. "Meeting fortunately with Dr. Scott," says Dr. B., "he accompanied me. The patient had all the appearance of imminent death; his face expressive of extreme terror and anguish; the extremities cold; the pulse hardly to be counted from its rapidity and weakness; the breathing all but impossible, apparently from some affection at the top of the windpipe; the voice was gone. On looking deeply into the throat, the pharynx and top of the larynx were seen of a deep red.

"The patient being too weak for bloodletting, and too ill for any slower measures of relief, Dr. Scott applied the solution of the nitrate of silver, which he happened to have with him. He got the sponge completely into the larynx. Mr. S. almost instantly expressed, by signs, his relief. In the evening he could speak a little, and was able to lie down in bed, and was in all respects better. He was blistered, and had calomel and opium.

"Next morning he was much better. The sponge was again applied without any difficulty. He recovered rapidly, and has been

for more than two years in perfect health, attributing without any hesitation, the saving of his life to the sponge and the caustic."

The valuable work of Dr. Watson contains his views with regard to the effects of nitrate of silver in the œdematous glottis, together with a record of several cases successfully treated by this remedy; and he expresses the gratification that he has been able to "come to precisely the same conclusions with myself, as to the strength and mode of application of the solution," in the management of this disease. He therefore quotes from my work the following directions, which are to be pursued in the employment of this remedy.

"The first application with the sponge-probang should be made to the pharynx and top of the epiglottis; and after a delay of ten or fifteen minutes, the measure may be repeated, and the sponge, wet with the solution, be freely applied to the base of the epiglottis and over the œdematous lips of the glottis. The application should be repeated every hour or two hours, according to the urgency of the disease, and the effect produced by the operation; and an attempt should be made each time to carry the sponge between the lips of the glottis. As the œdema at the opening of the larynx subsides, this may be done, and the application of the caustic solution be made to the interior of the glottis.

"I am inclined to think that the benefit arising from such a practice is brought about by the powerful stimulation of the relaxed vessels of the œdematous organ. Such a condition of the bloodvessels permits a continual increase of the morbid state, whereas, by their contracting under the stimulation, the current of blood within them is quickened, and the effused fluid is partly absorbed into the circulating fluid, partly removed by the new layer of epithelium, which is rapidly found to replace what had perished during the inactivity of the basement membrane, coincident with, and produced by the œdema of its subjacent tissue. Every touch of the probang renews the impulse already given to these restorative processes, and thus the benefit increases in a geometrical ratio, till the cure is finally accomplished."[1]

"The action of a solution of caustic," says Dr. W., on another page, "applied to a sub-acutely inflamed mucous membrane, might, *a priori*, be expected to produce a beneficial effect on the œdematous glottis; and this expectation has been remarkably fulfilled in my experience."[2]

[1] Watson, pp. 57, 58.

[2] Ib., pp. 54, 55.

5th. *Of the Effects of Nitrate of Silver in the Treatment of Hooping-Cough.*

To Professor Watson, of Glasgow, belongs the honor of having been the first to employ topical medication for the treatment of Hooping-Cough. His original paper on hooping-cough, in which he describes, "a new method of treating that disease," was read before the Medical Society of Glasgow, in 1849, and was first published in the *Edinburgh Monthly Journal* in December of the same year. Five years later—after having treated many other cases by this new method, Dr. Watson publishes, in his work on *Topical Medication*, the results of his experience; and these practical results have been considered in the highest degree encouraging. He has also given us, in this chapter on the laryngeal treatment of hooping-cough, the experience of *M. Joubert*, of France, who has employed, with great success, this topical method of treatment, in a large number of cases of hooping-cough. His memoir on the subject was published in a French journal, in 1851.[1]

In the opinion of Dr. Watson the indications for the topical treatment of hooping-cough are founded upon what is considered by him the true pathology of the disease. The morbific agent, he thinks, whatever that poison may be, "in the cases of hooping-cough commences its operations by producing inflammation of the pharyngo-laryngeal mucous membrane; and secondarily, irritation of the pneumogastric nerves."[2] And hence the declaration of his belief that topical treatment alone "is founded on the true pathology of the disease, and is fitted to counteract, the most speedily and effectually of all known means, the results of the mysterious poison which originates the malady."[3]

In the early stage of the disease, when the inflammatory action is high, Dr. Watson recommends, for children, the employment of a solution of the nitrate of silver, of the strength of about fifteen grains to the ounce of water.

"Afterwards, when the nervous symptoms predominate, the solution may with advantage be strengthened; but it is impossible to lay down rules that will universally apply to different cases, or even to the same case on different days. This must be left to the judgment of the practitioner."[4] It is recommended that the applications should be made at least every second day, first to the

[1] Recueil des Travaux de la Société Médicale de l'Indre et Loire. 1851.
[2] Op. citat., p. 107.
[3] Ib., p. 106.
[4] Ib., p. 116.

pharyngo-laryngeal membrane, then to the parts above the glottis, and to the opening of the glottis. "But after the general inflammatory state has been got rid of," says Dr. Watson, "and when the disease has come to its height, the larynx must be entered, in order that the caustic may be brought into contact with the nerves, upon the excitement of which the continuance of the hoop depends."[1]

The following favorable numerical account is given by Dr. Watson, of the results of the treatment in question, in his own cases, and in those of M. Joubert; the number of patients treated amounts to 134 in all:—

	Cured within a fortnight.	Cured within 3 or 4 weeks.	Resisted treatment.	Total.
Dr. Watson's cases . . .	46	20	0	66
M. Joubert's " . . .	40	20	8	68
	86	40	8	134

During the spring of 1854, hooping-cough prevailed in Glasgow as an epidemic, and Dr. Watson had an opportunity of treating a large number of cases. In the most of these the disease was very severe; and yet the result as given is as follows: cured in a fortnight *ten* cases; in three weeks *sixteen;* in four weeks *five; one* resisted the treatment; and *one* died.

The whole number treated being therefore 167, the proportions stand thus:—

Cured in two weeks	96 cases, or	54.4 per cent.
" three to four weeks . .	61 " or	36.5 "
Resisted treatment	9 "	
Died	1 case, or nearly	0.06 "

In contrast with the preceding results of the topical treatment of hooping-cough, Dr. Watson subjoins a table of the ordinary duration of the disease when treated in the usual manner, as stated by some of the best and most recent authorities, such as Williams, Copland, Walsh, West, and a few others; and the average of all the statements of these authors, is from one and a half to three and a half months.

The deaths from hooping-cough in London (and the percentage appears to be about the same in other parts of Great Britain), according to the reports of the Registrar-General, are in the proportion of 8.9 per cent. among females, and 6.2 per cent. among males to the deaths from all causes under ten years of age.

[1] Op. citat., p. 118.

"Surely, then," adds Prof. Watson, "a treatment which promised to diminish, or perhaps to annihilate this great mortality, ought to have been received with consideration by the profession," for, as the author subsequently remarks, "the numerical results just given prove in a manner beyond all cavil, that the simple treatment which I have suggested is capable of cutting short the hooping-cough with as much certainty as quinine arrests an intermittent fever; and moreover, that it renders the disease while it lasts both milder in type, and safer to the patient than the most favorable circumstances of season or epidemic could possibly do."[1]

So far as your committee has been able to learn, it is ascertained that this topical method for the treatment of hooping-cough has been employed only to a very limited extent in this country. During the last four years every case of hooping-cough which has occurred in the practice of the chairman of your Committee (and they amount to a considerable number of cases), has been treated by applications of a solution of nitrate of silver to the pharyngo-laryngeal mucous membrane. In all these instances, the peculiar symptoms of the disease, the spasmodic cough and hoop, have been arrested in from one to two weeks; and in several cases which occurred last winter, the hoop ceased entirely after the third application of the remedy: the cough, also, disappeared in a short time after. So far, then, as the experience of your Committee goes, it substantiates fully the favorable results obtained by Watson and Joubert.

Although to Dr. Watson has been awarded the honor of being the first who employed topical medication for the treatment of hooping-cough, still it would seem to be not inappropriate here to explain, as Dr. Watson has himself done, with great candor and fairness, "the way by which he came to try" this method of topical applications for the treatment of the disease in question. "Soon after the publication of Dr. Horace Green's work on *Diseases of the Air-passages*," he observes, "I had several opportunities of putting to the test of experience his method of treating chronic laryngeal affections, viz: by touching the lining of the larynx with a solution of the nitrate of silver. My trials fully confirmed his statement of the efficacy of the treatment referred to, and I soon found that I could with advantage carry out a similar practice in many other diseases, such as in ordinary acute bronchitis, in the intervals of asthma, and even with relief of the tickling cough in early phthisis. Having thus estab-

[1] Op. citat., p. 124.

lished, to my satisfaction, the efficacy of a topical application of caustic solution in cases not only of chronic disease of the larynx but in all cases of inflammatory irritation of the glottis, I came to the conclusion that it might operate beneficially in the hooping-cough; and, after a pretty extensive trial, I have not been disappointed."[1]

In closing this interesting chapter on topical medication, in hooping-cough, Dr. Watson expresses the hope that the day is not distant when the treatment, "so well described by these excellent writers, and the usefulness of which," he says, "I have now been enabled to establish, not only by its results in my own practice but also in that of M. Joubert, will be more favorably received in this country, and more generally adopted by British practitioners of medicine;" a hope which, by my own experience, I have been led most sincerely to entertain with regard to the practitioners of my own country.

6th. *Of the Effects of Nitrate of Silver in the Treatment of Spasmodic Asthma.*

If the histological observations of some recent pathologists be correct with regard to the nature of spasmodic asthma, it might be anticipated, *a priori*, that the application of a solution of nitrate of silver to the affected parts, would produce a most beneficial effect on the disease; and so far these expectations, in the experience of all those who have tried this remedy, have been entirely fulfilled. It is well known that there are only certain points in the course of the air-tubes at which a spasm can occur sufficient to produce the dyspnœa that takes place in asthma, and these portions are where the contraction of muscular fibres is not prevented by the existence of cartilaginous rings; the principal points are at the extremities of the bronchial tubes, and at the rima glottidis. Williams, in his work on the *Pathology and Diagnosis of Diseases of the Chest*, expresses the opinion that the contraction of the former, "the bronchial muscles, is a sufficient cause of spasmodic asthma."[2] Dr. Hastings believes that the constriction occurs in the larynx,[3] and Dr. Watson declares that the constriction in the minute bronchi cannot satisfactorily explain the complete stoppage of the breathing which

[1] Monthly Journal of Medical Sciences, Dec. 1849, p. 1290.
[2] Pathology and Diagnosis of Diseases of the Chest, &c., p. 91.
[3] Op. citat., p. 66.

occurs in the paroxysm. For this it seems absolutely necessary to assume that closure of the glottis likewise takes place on these occasions.[1]

Founded on these views of the nature of this disease, the last two named authors have adopted the plan of topical medication, in spasmodic asthma, and this treatment in their hands has been attended with complete success.

"In spasmodic asthma," Dr. Hastings remarks, "percussion elicits a tolerably clear sound from the thoracic walls. On applying the ear or the stethoscope below the clavicles, sibilant and sonorous rattles are heard. These diminish as we proceed in the examination towards the abdomen, but increase as we pass upwards towards the neck, and over the trachea or larynx their greatest intensity is evident, which region is, moreover, the real seat of the disease. The sounds heard in the chest are transmitted from this part, and this fact admits of ready demonstration.

"If a sponge soaked in a solution of the nitrate of silver be passed over the diseased surface, and the chest be examined immediately afterwards, the sibilant and sonorous rattles will have partially or entirely disappeared, and those of the laryngeal region become so much diminished that they cannot be propagated into the tubes within the lungs. Yet how repeatedly have I seen such patients with their chests cupped, leeched and blistered!"[2]

Several interesting cases of this disease are recorded by Dr. Hastings as having been successfully treated by topical medication. In one instance, the applications of a solution of the nitrate of silver failed to effect a cure when the author substituted a saturated solution of the bicyanuret of mercury in distilled water, under the use of which, and of light tonics, combined with nitric acid, the patient rapidly improved, and was restored to permanent health.[3]

"The state of the larynx," says Dr. Watson, "in spasmodic asthma, has not hitherto received adequate attention either from pathologists or physicians; in this opinion he expresses himself fully confirmed, that a morbid contraction of the larynx is a frequent cause of the disease, and that a spasm of the glottis dependent upon a lesion of this organ, constitutes an essential part of a fit of asthma.

On the subject of the treatment of this disease by local measures, Dr. Watson remarks: "I am far from wishing to laud the topical

[1] Op. citat., p. 127. [2] Ib., p. 66. [3] Ib., pp. 68–9.

applications beyond what they deserve, but I am sure any medical practitioner will bear me out in saying, that the ordinary treatment of asthma, by bleeding, general or local, by emetics, antispasmodics, opiates, and mercurials internally, with blisters and various other counter-irritants externally, has seldom been followed by even a partial success in these cases." "There is here, therefore, an evident blank in therapeutics, for no agent hitherto proposed has been found capable (says Dr. W.) of removing or greatly diminishing this morbid contractility of the air-tubes."[1] A solution of caustic, in the opinion of the author, "applied to the interior of the larynx, supplies this defect, fills up the blank." And he has recorded in his work many severe cases of spasmodic asthma, successfully treated, in the management of which no other means were employed, "but the regular application of caustic to the affected parts, at first every day, and afterwards every second day."[2] In the last edition of my work on "*Diseases of the Air-Passages*," several cases of spasmodic asthma are recorded, in the treatment of which cauterizations were employed with entire success; it has been, therefore, a cause of gratulation, that the statements of your Committee, with respect to the efficacy of the treatment have been fully confirmed in the experience of these distinguished practitioners.

Since we commenced drawing up this report, a new work, *On the Local Treatment of the Mucous Membrane of the Throat, for Cough and Bronchitis*, recently published in London, by J. E. Riadore, has been received. This work, in which topical medication for the treatment of many affections of the air-passages is advocated, contains nothing particularly new or important on this subject. The only novel suggestion made by the author, is one respecting the *temperature* of the solutions to be employed in local treatment. In spasmodic asthma, particularly, the author urges the employment of a *hot* solution of nitrate of silver. Indeed, he advises that, "in all spasmodic cases of the organs of the throat, the remedial appliances—the solutions, should be made hot, and used as warm as they can be borne."[3]

7th. *Of the Effects of Nitrate of Silver employed as a Topical Remedy in the Treatment of Tuberculosis, following or complicated with Bronchial Inflammation.*

Ten years ago, in 1846, in a work to which I have before alluded

[1] Op. citat., pp. 134–6. [2] Ib., p. 132. [3] Ut supra, p. 96.

(*On Diseases of the Air-Passages*), topical applications of the nitrate of silver were recommended to be employed in the treatment of Tuberculosis. On page 260 of this work is the following declaration: "Among the cases of laryngeal and bronchial affection, which, during the year 1845, came under my care, twenty-five presented decided symptoms of pulmonary phthisis, complicated with follicular disease. As the pulmonary symptoms, in a majority of the cases, had supervened upon the original glandular affection, topical measures were employed—not with the expectation of their proving ultimately remedial, but with the hope of deferring the pulmonary, by allaying the laryngeal disease; and the success which has attended these efforts in a majority of the above cases, in mitigating the sufferings and in prolonging the lives of my patients, has been to me a source of the highest gratification."

This proposition to treat a general disease by local measures, was not at that time, received with favor by the medical profession. And yet, the plan has since been adopted by large numbers of the intelligent portion of the profession in our own, and in foreign countries, who have given the highest testimony in its favor. Not only is laryngeal inflammation present in varying degrees of intensity in the early period of tuberculosis, but recent histological observations have fully established this pathological fact, that in all cases of tubercular deposit, there occurs in the immediate vicinity of the exudation more or less of an inflammatory action, in which all the adjacent structures are involved. The bronchial membrane and the pulmonary parenchyma become at once congested, and subsequently inflamed. The terminal extremities of the bronchi, says Prof. Bennett, are among the first structures affected, and as the tuberculosis proceeds, all the appearances characteristic of chronic bronchitis are produced, and are constantly going on in the progress of a case. "Consequently," he observes, "the great problem to be worked out, in the treatment of pulmonary tuberculosis, is that while, on the one hand, it is a disease of diminished nutrition and weakness, and consequently requires a general invigorating and supporting system of treatment, on the other, it is accompanied by local excitement, which demands an antiphlogistic and lowering practice."[1]

It is to meet this last indication, to subdue the local inflammatory action in the immediate vicinity of the exudation—an action which, if continued, will not only effectually prevent the disinte-

[1] Op. citat., p. 68.

gration and absorption of the tubercular mass already formed, but which will tend to augment the mass—that applications of the nitrate of silver solution to the congested and inflamed membrane, are advised in early, as well as in advanced tuberculosis.

Dr. Hastings, in his *Treatise on Diseases of the Larynx and Trachea*, has devoted a chapter to the subject of the topical treatment of tubercular, when complicated with laryngeal disease. In the earliest stage of this affection, "it should be met," says Dr. Hastings, "by the most vigorous treatment, and I know of no means so capable of arresting or removing it, as sponging the windpipe with a solution of the nitrate of silver."[1] Several cases are narrated by this author, which were successfully treated by this plan, one of which, as it is that of a surgeon of the army, and is of great interest, I shall take the liberty of giving, abbreviated. This surgeon "returned from India, in 1846, on sick certificate, having suffered for about two years previously from pulmonary disease. On leaving India, the symptoms were as follows: Cough, with copious muco-purulent expectoration, occasionally mixed with blood; frequent pain in the upper portion of the left chest, increased on deep inspiration; much prostration of strength, and considerable emaciation."[2]

After his return home he improved somewhat in health and strength, up to October, 1847, when he was suddenly attacked with acute inflammation of the left lung. From this attack he gradually recovered sufficiently to go to London, in 1848, for the purpose of consulting Dr. Hastings. About a week after his arrival he was again attacked with acute inflammation of the lungs, in which the larynx and trachea were involved. "At the commencement of this attack," says the patient himself, "the symptoms were as follows: Pains in the clavicular portion of the left side of the thorax, extending downwards; hurried and difficult respiration; inability to expand the chest, almost in the slightest degree, also when lying on the left side and back; quick pulse; much prostration of strength and extreme emaciation. I derived the greatest and almost immediate relief, when suffering from difficulty of breathing, from having the larynx and trachea sponged with a solution of the nitrate of silver. This attack gradually yielded to the treatment employed, when I was put on a course of the pyroacetic spirit, and cod-liver oil.

[1] Op. citat., p. 130. [2] Ib., p. 130.

"This treatment has been continued at intervals ever since, and to which I may attribute my restoration to my present state of health."

Dr. Hastings adds: "The writer of the above was, when he consulted me, about two years and a half ago, under forty years of age, and weighed 10 st. 6 lbs.; he now weighs 11 st. 4 lbs. When I first saw him, he had a large gurgling cavity in the upper lobe of the left lung; two or three of his medical friends laughed at the bare idea that any substantial good could be done for him. After completely removing the inflammation in the larynx and trachea, by sponging that passage twice a week with a solution of the nitrate of silver for three months, the disease in the lungs appeared gradually and steadily to diminish; and although at Christmas last, and for some time previous, he had lost all the general symptoms of phthisis, the cavity, which then was dry, and much smaller, was, however, still very evident. But now it has entirely disappeared—slight bronchophony is heard over its former seat, and more or less imperfect respiratory murmur exists in the upper portion of the lung, with considerable flattening of the superior part of the left chest." * * * *

"My object for inserting this case here is for the purpose of showing the great advantage to be derived from sponging the laryngo-tracheal tube with the nitrate of silver, in the early stage of tubercular laryngitis."[1]

Still more extensively has Prof. Watson considered this subject; the employment of local treatment in tuberculosis; and he has recorded several most instructive cases, in which the larynx was advantageously treated by topical means, in both incipient and advanced pulmonary phthisis.

In combination with, or to be followed by appropriate general remedies, he urges the importance of the use of applications of nitrate of silver to the larynx, in all those incipient cases of phthisis in which the cough is caused by actual laryngitis, by the irritation produced by the passage of bloody sputum; or by secondary nervous irritation of the larynx. The cough in these cases, he declares, "is not simply a symptom in the ordinary acceptation of the term; it is itself a disease, the result of organic change in the larynx, which increases the pulmonary affection. In treating the larynx, therefore, with a view of diminishing the cough, the physician is

[1] Op. citat., pp. 131–133.

not to be looked upon as irrational, but on the contrary, as aiming his remedial measures at the very source of much of the distress of the patient and of the fatal progress of the disease."[1]

No unprejudiced person can read the testimony embodied in the cases reported by Dr. Watson, without having the conviction forced upon him, that in many of these instances of early tuberculosis an arrestment of the pulmonary disease was brought about by the measures adopted. Not that the author would represent these cases as positively cured, "for undoubtedly," he remarks, "the tendency to tubercular disease still remains in the constitution, though its local manifestation has ceased to exist." * * "Formerly," he continues, "there was positive evidence of an actual consumption; now, there is no such evidence, but on the contrary, all the signs and symptoms of perfect health."[2] Some may doubt the relation of the topical treatment to the successful issue in these cases, says Dr. Watson, but no one can fail to perceive, "that the cough first abated as the laryngeal irritability was removed, then the general health improved, and *some time afterwards*, the pulmonary condensation was found to have disappeared."[3]

In the advanced stage of phthisis, in which the cough is caused or aggravated by laryngeal ulcers; or, in which the passage of purulent sputum produces laryngeal irritation, topical applications, says Dr. Watson, although they cannot be considered in the light of *curative* means, "ought nevertheless to be practised whenever the patient can bear them, as the surest and best means of relieving him from the pain and distress which are caused by the state of the larynx; and when cautiously pursued, even in such cases, I have known more than one life prolonged for months and even years."[3]

Dr. Cotton also, in his work on consumption, recommends the topical application of nitrate of silver to the larynx, especially in the early stage of the disease. "I would not advise it to be practised, however," says Dr. Cotton, "when the pulmonary disease is in a *very* advanced stage, and the strength of the patient much exhausted." Its use by him is restricted to the early period of the disease, when the lungs are not much affected, nor the strength of the patient reduced; it is this stage, he says, which presents the most promising opportunities for its employment.

The testimony of Dr. A. Scott Alison, in his treatise on the *Medication of the Larynx and Trachea*, is decidedly in favor of the

[1] Op. citat., p. 168. [2] Ib., p. 172. [3] Ib., p. 180.

employment of the nitrate of silver, in the treatment of that cough and irritation of the glottis, which are dependent upon the presence of tubercles in the lung. "Much comfort and benefit," he says, "have been derived from its use, both when the tubercles have been crude, and when they have become softened. The presence of undoubted cavities in the lungs, the breaking down of tubercles, and the expulsion of their débris, have not prevented this application from being decidedly useful."[1]

Prof. Robert B. Todd, Physician to King's College Hospital, London, who has had much experience, in the treatment of pharyngo-laryngeal and bronchial diseases, by topical medication, has embodied in his "Clinical Lectures," recently published in the *London Medical Times and Gazette*,[2] some of his views, and recorded his experience in relation to this subject. In the treatment of these affections, he employs and recommends "the local application of a solution of nitrate of silver (ʒss to the ʒj), by means of a probang thrust behind the epiglottis down to the glottis, on the plan of Dr. Horace Green, of New York." "The patient," he says, "can always tell whether the sponge enters the larynx or not, from the great irritation it excites when it passes into the glottis; and in the withdrawal of it, the operator feels a certain resistance caused by the sponge being grasped by the muscles of the larynx, which resistance is not felt when it simply passes into the œsophagus."[3] In one case reported by Dr. Todd, in which the symptoms indicated confirmed tubercular disease of the lungs, complicated with chronic thickening of the mucous membrane of the larynx and epiglottis, with ulceration of the chordæ vocales, and of the ventricles of the larynx, applications of a strong solution of nitrate of silver to the diseased parts, tended invariably greatly to relieve the extreme irritability of the larynx, for "the patient always expressed herself as much better after each application, and her pain was relieved, although only temporarily." But in the milder forms of the disease, the topical treatment often proved permanently beneficial; for Dr. Todd assures us, that he "could tell of numerous instances of coughs of the most troublesome kind, and of long duration, that had resisted all the ordinary cough medicines, and which had yielded to three or four applications of the nitrate of silver."

[1] Medication of the Larynx and Trachea, &c., p. 8.
[2] Medical Times and Gazette, No. 139, p. 207.
[3] Ib., p. 210.

Persons laboring under such symptoms as these, he declares, are often treated for bronchitis, and take large quantities of expectorant and other medicines, for the relief of the cough. The seat of the irritation, upon which the cough depends, is thought to be in the bronchial tubes, and its real position (the fauces) is overlooked.[1]

I have already alluded to the experience of Prof. Bennett, of Edinburgh, in the use of local applications for the treatment of those laryngeal diseases which, he assures us, are frequently mistaken for, or associated with, pulmonary tuberculosis. Dr. Bennett closes his valuable work on the pathology and treatment of pulmonary tuberculosis by the following practical conclusions:—

"1st. That not unfrequently diseases, entirely seated in the larynx or pharynx, are mistaken for pulmonary tuberculosis.

"2d. That even when pulmonary tuberculosis exists, many of the urgent symptoms are not so much owing to disease in the lung, as to the pharyngeal and laryngeal complications.

"3d. That a local treatment may not only remove or alleviate these complications, but that, in conjunction with general remedies, it tends in a marked manner to induce arrestment of the pulmonary disease."[2]

And here, the duty of the commission appointed to report to this Association "on the use and effect of applications of nitrate of silver to the throat," may be considered as fulfilled, and their work accomplished.

It was our intention, however, to have illustrated the great value of this therapeutic agent, in the treatment of the different forms of disease, to which we have referred by the history of cases which have fallen under our own observation, which would have corroborated fully the favorable reports made by the preceding authors. But this paper is already sufficiently extended. Justice to this subject, however, would not be done, should we fail to allude altogether to the success, which, during the last eighteen months, has attended the still farther extension of topical medication, in the treatment of thoracic disease, effected by means of the operation of *catheterism* of the air-passages, or the injections of a solution of the nitrate of silver into the bronchial divisions.

During the last eighteen months, or since October, 1854, over one hundred patients, embracing cases of both pulmonary and bronchial disease, have been treated by this form of topical medica-

[1] Op. citat., p. 209. [2] Ib., p. 142.

tion, conjoined with appropriate general remedies. The history of this plan of treatment and the results of the practice, results which have been in a high degree satisfactory, have been brought before the profession in papers read before the New York Academy of Medicine; before the State Medical Society of New York; and, more recently, a detailed report, embracing a statistical table of one hundred and six cases, thus treated, was published in the pages of the *American Medical Monthly*. Besides their publication in this country, most of these papers have been reprinted in some of the medical publications of Great Britain, and have also been translated and republished in a few of the leading journals of France. It will therefore be unnecessary to bring the whole subject before the Association; and we shall close the present report by a brief analysis of the cases embraced in the statistical table, which, with the history of many of these cases, may be found in the *American Medical Monthly* for March, 1856.

Of one hundred cases of thoracic disease treated by catheterism of the air-passages, seventy-one of the sum total are recorded as cases of *tuberculosis*. Of this number, *thirty-two* were considered cases of *advanced phthisis*—cases in which tubercular cavities were recognized in one or both lungs; and *thirty-nine* cases of *early phthisis*. Of the first division—advanced phthisis—fourteen have since died. *Twenty-five* were more or less improved; their lives being apparently prolonged by this method of medication. *Seven* only of the thirty-two cases of advanced phthisis were not benefited by the injections.

Of the *thirty-nine* cases of incipient tuberculosis, twelve of this disease have apparently recovered. Five more of this number are now, or were, at the time of making the report, in the enjoyment of a good degree of health. With respect to the above twelve cases, I say *apparently* cured; for, although the appearance of these patients, as manifested both by the physical and rational signs, is indicative of an ordinary degree of health, yet in a disease like that of tuberculosis, every medical man is aware that one year is a period too brief to speak decidedly with regard to the positive and final result.

Of the remaining *twenty-two* cases, many of whom, at the time of the report, were still under treatment, *seventeen* had been greatly improved by topical medication; three more had been moderately benefited; while *three* only had failed to obtain any advantage from the local measures which had been adopted.

Of the *twenty-eight* cases of *bronchitis*, sixteen had been dismissed cured, or so much improved as to require no further treatment. All the others had been greatly benefited, although some were still under treatment at the time of making the report.

Finally, in view of all that has been accomplished by topical medication, the chairman of the committee would reiterate the declaration made in the first paper communicated to the professional public on this subject, that, "the results of this method of treating disease, whether it has been employed in bronchial affections, or in the commencement of tuberculosis, have already afforded the most gratifying indications that practical medicine will be greatly advanced by this discovery."[1]

HORACE GREEN.

[1] American Medical Monthly, Jan. 1855, p. 25.

REPORT

ON THE

BEST MODE OF RENDERING THE PATRONAGE

OF THE

NATIONAL GOVERNMENT

TRIBUTARY TO THE

HONOR AND IMPROVEMENT OF THE PROFESSION.

By JOSHUA B. FLINT, M.D.

REPORT

ON THE

BEST MODE OF RENDERING THE PATRONAGE OF THE NATIONAL GOVERNMENT TRIBUTARY TO THE HONOR AND IMPROVEMENT OF THE PROFESSION.

THE Special Committee appointed at the last annual meeting of the Association, to take into consideration "*the best mode of rendering the patronage of the national government tributary to the honor and improvement of the profession*," in discharge of the duty thus assigned, ask leave to report

That, in most instances where the interests of the medical profession are directly affected by legislation, or by governmental interference of any kind, the agencies are those of the States, and not of the General Government. The States charter, and sometimes endow, our medical schools, authorize the conferring of degrees and licenses which constitute the only legitimate modes of introduction to the profession, and determine, by law, the public relations and responsibilities of its members.

Nevertheless, there are a few particulars, in which the honor and improvement of our profession are so materially involved in matters of federal legislation or administration, as fairly to challenge the animadversion of this body, and vindicate the propriety of the inquiry implied in the terms of our present commission.

In the first place, then, addressing the grand inquest, as it may be called, as well as the representative legislature of American medicine, we submit that there is a gross disregard of the honor and rightful prerogatives of the medical profession, in the practice of issuing patents to the proprietors of quack medicines, so as to afford the countenance and protection of law to the vilest forms of empiricism. No sensible person can doubt that, if these Patent-office indorsements contribute at all to the reputation and use of

such pernicious compounds, they exercise a most injurious influence upon the lives and health of the people, and are therefore in the highest degree reprehensible. But this more obvious view of their mischievous effects, is far from revealing the most serious objections to them. Their *direct encouragement* of quackery is, indeed, bad enough, but their *indirect discouragement* of legitimate medicine is far worse. Every patent issued for this perverse purpose, is a kind of official sanction of an old vulgar error, according to which valuable improvements in the treatment of disease have originated, and may still be expected, as fortuitous events in the practice of lucky doctors, or inspirations vouchsafed to favored ones; lucky hits of some bold experimenter, or rightful rewards of the vaunted devotion and experience of adroit specialists. Prevalent as it is—entertained even where we might expect better views of the matter—nothing is more destitute of support in fact, to say nothing of its intrinsic absurdity, than this notion of the empirical origin of improvements in medicine. We may safely challenge its most ready advocate to point out a single one of the acknowledged, enduring evidences of the advancement of our art, which can be traced to any such illegitimate origin.

On the contrary, every real improvement in medicine, every contribution to its curative resources which time and scrutiny have sanctioned—all have been results of patient and prolonged investigation, conducted by a succession of coöperative laborers, with every advantage which the light of science and methodical habits of study could supply. Never have they been, properly speaking, *discoveries* nor *revelations*, but always *inductions*—not the production and property of an individual, however fortunate or sagacious, but the legitimate fruits of the common efforts and devotion of a venerable and progressive calling. If any exception can be found to this general statement, it would seem to be presented in our acquaintance with the prophylactic agency of vaccination. But nothing would have been further from the illustrious Jenner, than to prefer an absolute and exclusive claim to the great idea of substituting the milder for the graver disease, and none would have been more ready than he to recognize and acknowledge the various aids and inducements to its conception and development, which were furnished by his professional associations, attainments, and motives.

Among the most remarkable ameliorations in the treatment of disease that have marked the present epoch of our art, undoubtedly

we may reckon that which has resulted from modern views of that important class of affections, very significantly denominated, by one of their ablest expositors, "*self-limited diseases.*" But who shall claim to be the discoverer of this better method; who may be its patentee, or venture to monopolize the honor of a beneficent triumph won by the united forces of our noble profession, in a conflict with error and prejudice obstinate and defiant as Sebastopol. And, when a happy consummation—hoped for if not expected by us all—of researches and experiments now in progress, shall have done for consumption what similar endeavors, half a century since, did for scurvy, who among those whose privilege it may be to witness the solution of the great problem—to supply the concluding and conclusive terms to the protracted formula—shall snatch the crown which a grateful world is eager to bestow on its great benefactor? "Not unto us"—"not unto us"—but unto that great corporation be the honor, under whose auspices, and by whose agencies were developed those various facts and principles each of which has been tributary if not essential, to the ultimate conclusion. Let us repeat, then, the affirmation which cannot be too often or too emphatically promulgated, that the world is not indebted, for sanitary truth or curative appliances to this or that medicine-monger, nor to this or that individual, however enlightened or philosophical; but to the world-wide, and almost world-old profession of Medicine, and very much to be deprecated is any institution or practice calculated to unsettle the confidence of mankind in legitimate medicine, as the only reliable source and fountain of remedial or prophylactic agencies.

There are those who sneer when we speak thus of *legitimate medicine*, and of the *profession of medicine*, with a contemptuous reference to the acknowledged deficiencies of many of its members, and especially to the alleged fluctuations and uncertainty of medical doctrines. But, legitimate medicine is not the practice of this day or that, of this country or that; it is not humoralism nor solidism, not the bleeding excesses of Rush, nor the indiscriminate purgation of Hamilton, nor the hepatic unopathy of Cooke. But it is the great aggregate of information and character which the scientific cultivation of medicine in all times has achieved. From the Homeric epoch to the present time, through all the various fortunes of the race, tradition and history conspire in assuring us that a regular succession of men has appeared, devoted to similar studies and pursuits, transmitting the acquisitions of each age to the succeeding

one, and so accumulating that mass of facts and conclusions which, sometimes more and sometimes less sound and beneficial, constitutes at every period the substance of legitimate medicine, in obvious and perpetual distinction to the various contemporary forms of quackery, that, like the counterfeits in our circulating medium, serve to confirm the reality and purity of the genuine article.

It is as idle to attempt to confound with this long recognized organization, any of the ephemeral systems which the presumption of ancient or modern empirics has substituted, as it would be to interpolate a "Commandment," or to associate a bastard with a patrician family of legitimate nobility for centuries.

And yet it is strange to observe what inadequate consideration is manifested for this old and humane profession, even among well-meaning and well-informed persons in every society. Individual physicians, ministering to the health and restoration of their patients, are not without their recompense in the gratitude and respect of those they serve; but the profession of medicine, one of the great elements of civilization, one of the earliest, perhaps the very earliest of the divisions of human labor involving intellectual effort, an institution that has accumulated so much curative truth for the infirmities of mankind, has prevented so much disease and death by its fearless investigations of epidemics and infectious diseases, that has taught us so far to obviate the pernicious tendencies of extreme civilization on health, as to realize, notwithstanding them, a remarkable prolongation of life, that in its collateral pursuits has enlarged the boundaries of knowledge in various departments of natural science—this profession, we say, does not itself command the respect and consideration that its age and services fairly deserve. Multitudes of persons take up the flippant depreciations of the "*old system*" without compunction; and the accumulated learning and wisdom of a profession of centuries, are talked of as lightly as the upstart conceits of a Thompson or a Hahnemann.

In matters pertaining to jurisprudence, whosoever disregards the precedents and authorities is reckoned a radical, and in theology, if one do not reverence the fathers, he is no better than a heretic. But what are "Law" and "Divinity," or the professions so called at the present time, that the body of doctrine, or weight of character they have respectively secured, should be more authoritative than those of medicine, compared with which both these professions are mere parvenues in the world of science. Hippocrates was a greater, as well as a more ancient man than Justinian; there was no contempo-

rary jurist or theologian to be compared with Baron Haller, and similar comparisons may be made in every epoch, equally favorable to eminent physicians in regard to all meritorious qualities that are cultivated in common. Why, then, should the body of professional conclusions, in their sphere of action, command less deference and respect than the *decisions* or *canons*, as the case may be, of the others?

Under such views as these, of the progress of the healing art, and of the true character of the profession, it is very plain that no good has come, or can come to either, from the patronage of the Patent-office; but, on the contrary, as we have already said, that every exercise of it is really an insult to the one and a hindrance to the other.

It is gratifying to learn, by a letter from the Commissioner, in reply to inquiries of your Committee, that the practice of the Office has been such, of late years, as to discourage this objectionable employment of its powers. "Since the law of 1836," says this officer, "the following patents only have been granted for medicinal compounds: one patent for a vermifuge, in 1837—one for cure of syphilis, in 1841—one for vegetable elixir, in 1843, and one for an ointment, in 1844."

"These, if the famous Ether patent of Jackson and Morton be excepted, are the only patents granted, since the time referred to, as appears by the records of the Patent-office. If there be any other compounds before the public, under the guise and appellation of 'patent,' it cannot be for anything other than for the *design of a label*. Such cases, when scrutinized, will probably be found to be merely a patent for a label, and not for a composition of matter. Although twenty or thirty applications are received annually, as appears by the record, it has been the practice of the office almost universally to refuse to grant a patent for medical prescriptions."

The intelligence and conscientiousness of the Commissioner and Examiners have, to a great extent, counteracted a vice in the policy of the laws they are appointed to administer, and they deserve the thanks of their fellow-citizens for their determination, in this regard. But it is not a thing which should be left to the discretion of executive officers. It is a vicious element in the statute, which should receive legislative correction, so that the government of the nation should no longer participate in the impositions of quackery, or lend its protection to a species of traffic as unprincipled and pernicious as can well be imagined. It is strange that so offensive a

practice should have continued so long. No medical gentleman who has had any share in the councils of the nation, has been altogether blameless, in regard to the continuance of such a stigma upon his profession, as is implied in this legal recommendation of quack medicines. What a storm of indignation should we not have witnessed from the "gentlemen of the robe," if any department or bureau at Washington had been so administered as to have involved a constant reflection upon "the perfection of human reason." In this connection, we must not omit to commemorate, as it deserves, a recent decision of the District Court of Pennsylvania, which, if it pass into a precedent, as it should do, will go far to extinguish the evil of which we complain. An action for damages was brought by a party, charging that his patent label for a quack medicine had been violated. The judge decided that there was no remedy, in chancery, for such a case, inasmuch as the article alleged to have been imitated, having no intrinsic value, but, on the contrary, being, like all such nostrums, positively pernicious, could never be entitled to the protection of law. Honor to the enlightened jurist who uttered this righteous decree. He would rescue the august tribunals of justice from the least participation in the abominations of quackery—the ermine, at least upon his robe, shall escape any such contamination.

It will be observed that the Committee have animadverted upon the matter of patent patronage, only as a function of government affecting the medical profession, and not as an expedient to secure the exclusive use of remedial agents to those who claim to have invented or discovered them. It would hardly be decorous to advert, even, to the latter view, in this place, inasmuch as the principle that no such inventions or discoveries in the healing art are to be regarded by physicians as private property, which has been a settled characteristic of the profession for centuries, has been formally incorporated into the ethical code of this Association, and was insisted on at its very last annual meeting, to the extent of requiring an affiliated society to reconsider its approval of one of the most excusable violations of the principle under penalty of unqualified disfranchisement and alienation. In regard, however, to the practical application of this liberal principle of medical ethics, there is a difference of opinion relating to a large and important class of cases which have hitherto been exempted from its application. We refer to the copy-right protection. What is the difference, it is asked, in view of the subject now before us, between

securing a copy-right for a medical book, and taking out a patent for a medical prescription, or for a surgical instrument? It will not be long, we apprehend, before the Association will be called on to promulgate its interpretation of this part of its code of ethics.

The republican genius of our government, and its limited powers and functions, incapacitate it from becoming, directly, the patron of any of the liberal arts and sciences, and there are peculiar difficulties in the way of its becoming so to the cause of medical science. Rank, titles, decorations, pensions—favorite expressions of royal or imperial favor towards public benefactors, are not at the disposal of our rulers, wisely withheld, in deference to one of the forms of that "eternal vigilance," which is the "price of freedom." It is only by virtue of some indirection, or legislative artifice, that Congress has occasionally appropriated money in aid of some important philosophical investigation, or in remuneration for the public use of some art or invention whose proprietor is protected by patent. Most of these appropriations have been made for contributions to the art or implements of war; a few for the promotion of natural philosophy, but none for the inestimable benefits conferred on the country and mankind by improvements in the healing art.

Far be it from us to refer to this latter particular in a spirit of complaint. Medicine has not only not received any such "material aid," but, with a single exception, she has never asked it. Her disciples have found adequate incentives to the highest professional effort, in the liberal private patronage which generally awaits the faithful physician, in the eminent position which society assigns him, and may we not add, in a consciousness of the dignified and beneficent character of their vocation. They need not any extraneous inducements to duty, and least of all, the sordid one of public bounty.

We know it has been often alleged that the want of such extraneous stimuli as are supplied by the distinctions or pensions conferred by government, has been felt, by the profession of this country, with the effect of rendering their contributions to the progress of their art comparatively inconsiderable in number and value. This allegation, whether uttered, as is sometimes the case, in a spirit of friendly, but mistaken regret, or with the tone and temper of contumely, is alike unfounded in all that it predicates, and especially in its assumption, that American physicians have

been less active and efficient than their transatlantic brethren in promoting the medical reforms and improvements which have blessed the world, during the last half century. It is only to the superficial observer that bustle, display, publicity, are unequivocal signs of progress. There are other things besides the sublime phenomenon of which it is predicated by the inspired writer, that "come not of observation." Undoubtedly, in some matters of purely scientific research, both elementary and transcendental, our European brethren have gathered laurels to which we cannot aspire. But, in those higher exercises of the physician in which scientific acquisitions are applied to the treatment or prevention of disease, and wherein are achieved the real improvements of the healing art—in all such exercises, nowhere has there been exhibited more address and efficiency than in these United States.

Very significantly was it said, in one of the earliest and ablest of our reports on medical literature—"a Frenchman looks on disease to find what he can make of it; a German, what he can think of it; but an American, what he can do for it." If it were pertinent to our present undertaking, it would be easy and pleasant to show how faithful American physicians had been in that division of professional labor to which their constitutional or national adaptation was thus indicated, and to demonstrate how largely they deserve to participate in the glory of medical progress, and in the gratitude which that progress should inspire.

Some Americans in Paris, to whose "circular" we shall presently have occasion to refer, mistaking the restlessness and activity around them for exemplary progress, are begging their countrymen in the United States to send them "books," whereby to refute the disparaging ideas of American medicine, which are entertained and expressed by their Gallic associates. *Book-making, authorcraft* is one of the prevalent forms of pseudo-progress—a favorite medical buncombism, if we may coin a word—of the present day. If we could only send over an octavo or two on strabismus, a quarto on fractures of the fibula, or a folio on the pathology of the renal capsules, we should relieve our young countrymen's patriotic mortification vastly, and enable them to claim for us a place among those indefatigable scribblers, every fourth one of whom has conquered his "cross," and written himself into the privilege of wearing a striped ribbon in his buttonhole.

It has elsewhere been said, and we repeat the remarks without a shadow of dissent, "no four men in the world have done more

towards introducing the improved methods of treating disease which have made the glory of our profession in the present century, than Physick and Nathan Smith, among the dead, and James Jackson and B. W. Dudley, among the living worthies of American medicine; and yet we believe that the aggregate publications of these noble physicians would hardly constitute a respectable octavo. By forming the professional character of their pupils, by their daily professional intercourse with their fellows, in the thousand ways in which a good example makes itself felt, do such lights of their day and generation diffuse their healing knowledge through wider and still wider circles, and inculcate the lessons of that great code, the 'lex non-scripta,' the *wisdom*, rather than the *science* or the *art* of medicine."

We have enlarged upon this incidental topic into what the critics would call quite a little episode; but must trespass somewhat further to say, that we were moved to the irrelevant remarks—if indeed they be such, by a recent example of the offensive imputation against which they are directed, contained in a "circular" addressed to the medical profession in this country, by the "American Medical Society in Paris," and which, we confess, that we could not read, as the editor of the respectable periodical in which it appeared, declares that he "published it"—"with pleasure."

"The American physician" says the "circular," "still encounters in the wards of the Parisian hospitals, the sneering question, what have you ever done in America to advance the science of medicine?" and again—"the almost complete forgetfulness with which the profession of the United States is passed over, on the one hand, and the ridicule with which it is treated, on the other," &c. &c.

Now, these patriotic young gentlemen of our affiliated society do not repeat these things as if they believed or approved the slanders, of course; on the contrary, their purpose is to procure books, and other means of refuting them. But, under favor, we must say that they had better never have repeated them at all, but put them at once and forever in the category where they belong, by resorting to the method of the "wisest of men," who advises us to answer a certain class of persons after their own fashion. No, young gentlemen—your countrymen will hardly trouble themselves to assist you in a serious refutation of such impertinence, and the last thing they would feel called on to do, would be to submit their merits as practitioners of medicine to such tribunals as should be constituted by any class of officials in Parisian hospitals.

The single exception, to which we just now referred as an instance of a medical claim on Congress, is found in the memorable attempt, still fresh in our recollection, to procure from that body a pecuniary grant in favor of Dr. Morton as the originator of etherization, and this example is full of instruction, both as to the unsuitableness and uncertainty of that species of patronage in behalf of improvements in medicine. That attempt failed, and although a multitude of eminent medical gentlemen were seduced by the enthusiasm of the time to memorialize the government in its behalf, we suppose that few, if any of them, are now sorry for the failure. The proceeding, suggested and sustained by liberal and praiseworthy feelings, was nevertheless essentially vicious in two particulars. In the first place, Congress undertook to settle a question as much out of its province and capacities as would have been the physiologico-theological point before the late pontifical conclave at Rome, the question arising under the conflicting claims of Morton and his contestants to the discovery of the means of artificial anæsthesia.

In the second place, Congress undertook to compliment and reward, for an alleged improvement in medical science and practice, an *individual* instead of the *profession*.

We have already indicated the basis of this objection, in our remarks on the *methodus veniendi* of all valuable improvements in the treatment of disease, and a glance at the early facts of the case will show that anæsthetic etherization presented no exception to our general experience in this matter.

What, let us ask, was the patent "*Letheon*" of Dr. Morton, but an arrant piece of quackery, the employment of which, by the surgeons of the Massachusetts General Hospital, even the unquestionable respectability of those gentlemen could hardly protect from the reprobation of orthodox and considerate practitioners?

Not until it had been stripped of its secrecy, and Letheon had become sulphuric ether, under the demands of the profession; not until the principles of medical science had been applied to the administration of its vapor by inhalation, by the profession; not until the conditions of safety for this administration had been investigated and approximatively determined by the profession, did anæsthetic etherization become a boon to humanity, or anything else than a seductive and dangerous nostrum. We submit, then, that whatsoever debt of gratitude the world has incurred in this behalf was due to the medical profession, and not to Dr. Morton, nor to either of his competitors.

But how then shall such a debt be cancelled? In what manner shall the public gratitude express itself for medical benefactions? Is not the committee insisting on an abstraction? Where are the corporate interests of the profession, and how are they to be cherished and promoted, independent of remuneration to individuals? We answer, in the first place, that those interests are here committed to this Association, so far at least as the American branch of the profession is concerned.

If the heart of the republic be moved with gratitude towards public benefactors, or proud of genius and science whose researches have made humanity their debtor, let it bring hither its acknowledgments, and lay upon this altar whatever tribute it would offer to the cause of medical improvement. Volumes of choice and valuable contributions to this cause are annually prepared by this Association, and it would be a graceful compliment, in imitation of what the States have, in some instances, done for their respective branches of it, for the national treasury to supply the means for the publication and extensive distribution of these volumes, which are at once proofs and means of professional progress. We annually establish prizes, as incentives to investigation in such departments of science as promise to afford us the materials for a better knowledge and treatment of disease. A pittance that would never be missed from the millions of public treasure, placed at the service of the Association for such purposes, might stimulate to productions of which the nation should be proud, and humanity the thanksgiver. We assign to committees the duty of elaborate investigations, the collection of statistics, &c. &c., involving a great amount of labor, large consumption of time, and not unfrequently considerable expenditure of money. Whoever will glance over the subjects which have been, and now are receiving the devoted attention of these committees, will not fail to perceive that no labors, undertaken in any department of art or science, are more likely to result in what may truly be regarded as *public benefits*, than some of these, and that none better deserve, if pecuniary expenditure become necessary in their prosecution, to receive substantial aid from the *public funds*.

If it be objected that Congress has not the constitutional power to grant pecuniary aid and rewards for such purposes; without attempting—without desiring, even—to argue down such scruples of the strict constructionist, we would submit our suggestions under

favor only of the numerous precedents which are pertinent to the case. If Espy could draw from the national treasury a handsome sum to aid him in philosophizing the caprices of the clouds and winds, and if Morse, from the same source, be generously assisted in his experiments on telegraphic electricity, it is not easy to see why the same substantial encouragement should not be extended to a body of learned men, collected from every portion of the country, employing themselves in the consideration of vital statistics, in the solution of the momentous problems of epidemics, or in establishing the sure foundations of public and private hygiene. If seventy thousand dollars and upwards, may be conferred upon the heirs of Robert Fulton, for his improvements in navigation by steam, is it unreasonable to hope that some warrant may be found for devoting a far less sum to the corporate uses of a philanthropic body, like this, which is the only American heir to the long line of medical worthies whose successive improvements in the healing art have imposed such unrequited obligations on mankind?

But, there are a few instances of more direct and legitimate medical patronage in the hands of our national government, in the exercise of which we may suggest some changes calculated to render them far more tributary to the honor and improvement of the profession, than they now are, by causing them to operate as powerful incentives to medical effort. This salutary influence is but very imperfectly realized under the existing method of administration, and a great injustice, we respectfully submit, is the consequence to the cause of medical improvement, and to those ambitious and indefatigable men who have a right to participate in all the honors and distinctions which the institutions of their country can rightfully be made to bestow upon medical merit. Comparing the action of the government, in this species of patronage, towards the two secular Professions, the injustice and inexpediency of the present course will be at once apparent. When a justice of the Supreme Court is to be appointed, the Executive does not limit his choice to the bench of the district courts, but casts his eye over the whole field of judicial merit, private and official, within the circuit, and by this practice not only secures to himself a better chance of a good selection, but presents perpetually to the whole "bar," a prize calculated to stimulate, to the utmost, every noble-minded and aspiring lawyer.

So, too, when a President is calling to his cabinet an attorney-

general for the nation, is no one thought of, for the place, but some member of the corps of district-attorneys, who claims it by seniority or some other conventional principle of promotion? Far otherwise. High legal reputation and eminent forensic talents are the "anterior titles"—as the French have it—to this distinguished position, which thus becomes the source of a widely diffused emulation, highly promotive of learning and usefulness in the bar.

How is it, now, in the distribution of a somewhat similar species of patronage in the other profession? A "Surgeon-general" of the army, or the chief of the bureau of medicine and surgery for the navy, is to be appointed, and none are in the "line of safe precedents," except the little corps of army or navy surgeons, as the case may be. This mere fragment of the profession, with no more merit, as physicians or citizens, than thousands of their brethren throughout the land, are the only persons interested in the distribution of public honors, which, otherwise awarded, would animate and encourage the cultivators of the healing art in all parts of the country. Wherefore is it that these appointments are managed so differently in the two professions? Is there any reason in the nature of the one case or the other, in the rights of parties, or in general considerations of public policy, for this marked and mischievous disfranchisement of medical men? The duties of these chiefs of the medical staffs of the army and navy, are advisory and administrative, like those of cabinet officers—the details of their functions being now generally intrusted to subalterns, detailed from their respective corps—and there is no more propriety in requiring them to have personal experience in the details of camp or ship service, than there would be in requiring the Secretary of the Navy to have been a boatswain's mate, or the Secretary of War, an orderly sergeant. In fact, there should be but a single superintending officer for the medical affairs of both branches of the military function of the government, with pay, rank, and emoluments that would place him on a level with any of the immediate aids and advisers of the President.

The marine hospital system has now become an extensive and important department of the public service, requiring some central superintendence, and would much more naturally fall under the charge of such a medical chief, than be comprehended as it now is, among the multiplied and uncongenial duties of the Secretary of the Treasury. Who can doubt that a medical bureau of this kind,

at Washington, would have found as competent a chief in our distinguished Physick, as did the chief-justiceship in his illustrious patient; or that our veteran surgeon of Lexington would have graced such a professional position as much as did a lawyer of the neighboring city of Frankfort, that of Attorney-general?

Furthermore—there are boards of examiners occasionally or periodically instituted by the government, to pass upon the qualifications of those who desire to enter the medical staff of the army or navy, and, for this duty, a certain number of the corps are detailed by their chief, as other officers are detailed for courts-martial, or as one of their own number would be detailed to superintend a flogging, or to condemn tainted beef. Now, we submit that the function of these boards is not military, but scholastic, and that more suitable persons could be summoned, by the government, from the body of the profession, than are likely to be found among the medical men of the regular army. The subjects of these examinations are generally young gentlemen recently from the green-room of our colleges, or, at any rate, entirely inexperienced in the duties of the camp or field, and, of course are not expected to be tried on technicalities, nor on questions respecting which the army or navy surgeons might be of use as *experts*, but only on questions of medical science and practice which involve the qualifications that are alike essential for military and civil service. It would be absurd to expect military qualifications in the recent medical graduates, who present themselves for examination, and it is ridiculous, therefore, to insist upon the necessity of military qualifications in the examiners themselves.

But, besides these negative objections to the present constitution of these boards, there is a positive one more serious still. The medical staffs of the army and navy are thus made, respectively, self-perpetuating public bodies. The present members of the corps, holding their official privileges for life, have the power of determining who shall be their successors, or who their new associates, in case of vacancies. Whoever considers the potency of the *esprit de corps*—how liable it is to degenerate into partialities antagonistic to the general welfare, will find reason to distrust the proceedings of a board of examiners whose decision is not only to determine the qualifications of a surgeon for the public service, but also to admit a new member into their privileged and exclusive community—the terms of good fellowship by no means necessarily corresponding to

the qualities that are essential to a good practitioner of medicine and surgery.

Notwithstanding, therefore, the very favorable estimation in which, we are aware, the present method of examining the candidates for medical commissions, is held by the gentlemen of the public service, as well as by many other physicians, we are inclined to believe that a better one, especially in the view of the subject now before us, would be, to call together, from different parts of the country, a suitable number of gentlemen who are distinguished in their respective communities, as scientific and skilful practitioners, and to constitute the tribunal, in all respects, so as to render it a dignified exponent of professional character, and a membership in it, a worthy object of professional ambition.

The government would only have to instruct such a board to maintain a high standard of qualifications in its requisitions, and it would be effectively done. The double purpose would thus be accomplished of providing for the candidates a competent and disinterested board of examiners, and of employing the patronage of the government so as to operate as an incentive to medical effort and distinction throughout the profession. The earliest board of examiners, for the army medical service, consisted of Drs. Holton and Taylor, two eminent practitioners, without either military experience or prestige, to qualify them for the duty. The venerable author of our *Medical Biography*, Dr. Thatcher, assures us that at the time of writing his interesting memoirs, between 1820 and 1830, he remembered well the rigid examination that he underwent before these gentlemen in 1775. If the administration of our modern boards could point, as the result of their discrimination, to such a corps of surgeons as were passed by the old revolutionary board of private physicians, it would be a better argument against the change we are advocating, than any we are now aware of.

Better still, however, than these special examinations, whether by "boards civic or boards martial," for supplying the ministers of war and the navy with suitable material for replenishing their respective medical corps, would be the following method, commending itself especially for its encouraging influence upon the cause of medical education, in which the corporate interests of the profession are vitally involved.

Let the faculty of every medical school in good standing with this Association, annually confer upon one, two, three or more, as need may be, of the most accomplished and meritorious of their

graduates, certificates of qualification for army or navy preferment, and let the delivery of these certificates make a part of the public exercises of the commencement. Then, as many of these nominees as desired to receive a commission in the public service, need only transmit their certificates, accompanied by their name and address, to the proper bureau at Washington. The secretary would then have before him the names of the most promising medical young men in various parts of the country, and could make his selection for surgeons according to any impartial principle of choice that might be deemed best.

By this method of designating candidates for commissions, the government would be saved the expense and trouble of assembling examining boards: the young men would be spared the expense of travelling to and from the place of meeting, and of several weeks' detention there—an expense that is an absolute bar to the ambitious and patriotic aspirations of many a worthy, but indigent young man, and the medical schools would be furnished with a species of stimulus and incentive to study, in their classes, more effective than any scheme of prizes or scholastic honors that can be devised.

The topics last brought under consideration are not new to the inquiry and reflections of the Committee, but familiar and well considered views, the chairman having presented to the public, some years since, substantially the same recommendations for which he now invokes the favorable consideration of this professional tribunal.

In its relations and dealings with its medical employees, our national government must reform largely before it can be said to do anything in that regard, for the honor or improvement of the profession. In its present conduct, instead of being the liberal patron of an art whose services it invokes for its disabled soldiers and seamen, it is only and eminently, a parsimonious, exacting and ungrateful employer. How utterly regardless it is of the proprieties of professional life and associations, among those whose position is determined by its dictation, has been illustrated in its backwardness to comply with the repeated solicitations of our brethren of the army and navy for relief from a dependence upon the caprice of superior officers for the courtesies belonging of right to a definite rank in the service. In its selection of candidates for these two corps of surgeons, it has renounced the test of "graduation," which it is the policy of the profession to maintain, and which, although we all

know that a degree is far enough from being conclusive as to qualifications, is nevertheless the best *primâ facie* evidence we can have of preparation for practice. Our code of ethics declares that "a regular medical education furnishes the only presumptive evidence of professional ability and acquirements, and ought to be the only acknowledged right of an individual to the exercise and honors of his profession."

In its arbitrary division of these bodies of medical gentlemen into two orders, with equally arbitrary assignment of superiority to the one and subordination to the other, the government has established grades and criteria of merit unknown to the profession, unjust to parties interested, and in derogation of professional equality. While the "Assistant Surgeon" is liable to encounter the same duty and responsibilities as the "Surgeon," his pay, rank, and emoluments are far less; and, of two medical gentlemen whose professional associations are elsewhere the same, while doing the same duty on shipboard, the one is the privileged associate of the officers of the "ward-room," while the other is degraded to a companionship with the boys of the midship. And these inequalities and hardships come of the government's disregarding the professional character and prerogatives of these gentlemen, and unwisely endeavoring to render the military, paramount to the medical element, in the constitution of the bodies to which they belong.

Considering the very inadequate pecuniary remuneration allowed to the medical officers of the army and navy, so inconsiderable indeed, as to be itself almost a reflection upon their calling, it would seem to be eminently the duty of government to render their condition in every other respect as eligible as possible, and to encourage rather than suppress, the manifestation of that *esprit de corps* which implies a love of, and devotion to the essential functions of their office.

The Chief of the bureau of medicine and surgery in the Navy, to whom, as well as to the acting Surgeon-General of the Army, the Committee would acknowledge its obligations for their ready and satisfactory responses to our letters of inquiry, concludes his very acceptable communication with the following remark, which commends itself to us alike by the fraternal regards the writer evinces for his junior associates, and his filial appreciation of our common profession. "I know of no mode of making the medical patronage of the National Government tributary to the honor and improvement of the profession, more efficient than the adoption of such

measures as may secure to its members, within the naval service, a position and compensation, especially the former, more in accordance with the dignity and responsibility of our calling."

As to the dealings of the national government with private physicians, when called to render services in the place of Army or Naval surgeons, they are still more illiberal and derogatory. With a suspicion extremely offensive to an honorable gentleman, it uniformly bargains for the fee in advance, and when an account is presented for ordinary medical services, it requires such a vexatious array of vouchers and verifications, as to render it hardly worth collecting; while for all extraordinary services it assumes the disgraceful ground of open repudiation.

The general experience of mankind, in cases of severe or protracted illness, bears testimony to the desirableness and efficacy of consultations, and there is no experienced physician who does not know that he has often received and imparted, on such occasions, the most valuable aid in the management of obstinate or obscure diseases, nor failed to realize what is said of them in our code of ethics—"that they give rise to confidence, energy, and more enlarged views in practice." Nevertheless, consultations are absolutely denied to those who are dependent on the national government for succor when sick or wounded in the public service, and the soldiers and seamen of the Republic are compelled, by the parsimony of the State, to forego means and advantages for recovery that are not withheld from any slave in the land; one of the regulations of the medical department of the army declaring, with a disgraceful distinctness, that "accounts for consultation visits are not, *under any circumstances*, to be recognized as legitimate claims against the United States."

To what economical expositor of national ethics the government was indebted for this remarkable determination, we are not informed; but it appears in a little book, entitled: *Regulations for the Medical Department of the Army*, and therefore must be presumed to have passed under the eye, perhaps we may say, to have secured the approbation of the Surgeon-General, the chief of that department. If it were indeed so—if so unprofessional a regulation, to say the best of it, was adopted without the earnest protest of that officer, he is certainly not the person to be intrusted, as he has been by the favor of our Association, to dispense the privilege of membership on this floor.

The Committee have thus brought to the notice of the Associa-

tion, in a very cursory manner, the various topics that seemed pertinent to the somewhat indefinite inquiry referred to them—some of these topics having a direct and positive, and others only a negative bearing upon the matter under discussion. The *purpose* of our argument, whatever be its *force*, has been to assert the priority and the superiority of the claims of our profession, in its corporate capacity, to those of any individual members of it, and to insist upon a recognition of those claims, by the national government, in all of its operations that can affect, in any manner or degree, the interests or honor of medicine.

We do not propose to invite the Association to any definite action in the premises, by the passage of resolutions, at the present time, but indulge the hope that our suggestions, and the reflections to which they lead, will not be without the effect of awakening more attention to the subject, among the members, inspiring them with a more intelligent and zealous *esprit de corps*, and contributing some facts and motives to render their individual action and influence, in whatever manner they can be employed, conducive to the most encouraging patronage of legitimate medicine, both from public and private sources.

JOSHUA B. FLINT,
Chairman.

REPORT

OF THE

COMMITTEE ON EDUCATION.

BY WM. HENRY ANDERSON, M. D.

REPORT OF THE COMMITTEE ON EDUCATION.

No subject could come before the Association of more interest and importance than the one on which this Essay is founded. Your Committee has had it under consideration for two years, and although during that period many thoughts have suggested themselves, yet it is quite difficult to present them in that concise and intelligible manner, which should characterize all the reports made to your honorable body.

In taking a review of the various systems of Medical Education pursued on the Continent of Europe, and in the United States of America, your Committee has had an opportunity of seeing many faults that might be exposed, and many examples worthy of imitation, and if it were our province to suggest a correct system of medical education, it would be comparatively easy; but our task is far different and much more difficult than that. We have to take things as we find them, and attempt to reconcile what *is*, with what *ought to be*. No one will deny that the standard of medical education is too low in the United States—that the license to practise is granted on the faith of attainments far too limited for the good of the profession and of the public; but how to prevent this in a country where laws are made by uneducated and untutored minds, is the great and insurmountable difficulty. When state legislatures will grant charters to any half dozen physicians to make colleges in which the science of medicine may be taught in a few months, and where there is no higher law to which to appeal for redress, the more elevated members of the profession can have little left to hope for. Still it is not their province to give up in despair. Already by their united efforts in council they have accomplished something, and although the encouragement is small, yet it is enough to stimulate them to continue. The present, too, seems to be an auspicious period for serious action on the part of the medical

profession, in raising their standard of collegiate attainments. All parts of the country seem to be awakened to a sense of duty in providing for public education, and in extending it as far as possible. Even those States which for years past have manifested indifference and apathy towards the great cause of education, are now busily engaged in developing systems which will place within the reach of all classes of the community, not only the rudiments, but the higher branches of knowledge. The popular mind is thus taking hold of the subject, and it is to be hoped that our profession will partake of the general improvement, which appears to be slowly but surely going on.

The Federal and State constitutions of this country have been so formed as to allow of individual liberty of thought, opinion, and action in its widest sense. This is a great blessing, and constitutes the glory of our republic; but it is a drawback to a science like that of medicine, which requires concentration of power somewhere, in order that certain laws may be enforced to prevent abuses and correct faults, whether they be found in medical colleges or in State codes.

That the American mind is capable of attaining the highest degree of intellectual improvement, is a proposition that needs no argument to support it. The annals of jurisprudence, of political, natural and medical science, can point among us to the ablest, most comprehensive, and most practical minds which have adorned any country or any age. In this respect no section of our vast country is inferior to another, for the triumphs of practical intellect are to be found in every part of it. No portion of our varied climate is so enervating as to weaken the mind—no method of living is so luxurious as to debase the intellect. The foundation, then, for any degree of attainment is here, and we want only either an inward sense of duty or a properly directed system of instruction to carry us to any point within the grasp of human intellect.

The science of Medicine is such by its very nature, that it can be properly taught only in populous towns. The practical part of it ought to go on *pari passu* with the theoretical. If it do not, the graduate must go forth into the world incompetent to do his duty. If the population surrounding him could judge of his qualifications, all danger would be averted, and the evil would remedy itself. But inasmuch as the masses *must* be ignorant on those very subjects which most conduce to their welfare and happiness, they ought, if possible, to be protected by proper legislation. All edu-

cated physicians are aware that practical medicine can only be studied in hospitals and infirmaries; but the desire for popular applause and thirst for reputation of a name, induce many to seek charters for colleges to be located in any little town or village in which they may happen to reside. The fault exists not in the fact that there are too many medical institutions, but that one-half of them have not the facilities to teach the science as it should be taught. The wants of our population require three thousand graduates yearly, and we believe that this number would be much better prepared at a dozen colleges, than at two or three; but those colleges should exist at such places as could afford sufficient clinical instruction, and as it would be impossible to draw the line of demarcation which would constitute a city sufficiently populous for a medical college, there ought, in justice to the community, to be a higher tribunal before which all graduates should appear, and be impartially examined before receiving license to practise. If the licentiates of colleges from town and villages would in every case seek populous cities to perfect their education in hospitals and infirmaries, all would be well enough—but the *few* only do this, while the *many* go out into the world unprepared to do anything but injure the community, and degrade the profession by their inability and ignorance. This is the reason why the standard of medical education is low, why the doctor has no more elevated position in society than the tradesman, and why so much opprobrium, uncertainty, and doubt are cast upon a noble and humane profession. The writer of this report has read with care the numerous papers on medical education which have been presented to this Association. Many of these have been written by the ablest medical men of the country; men whose talents, experience and long connection with educational establishments, enabled them to present the most practical suggestions for the benefit of the profession, and yet up to the present time no set of resolutions passed by the Association has ever been heeded, and nothing of practical utility has been accomplished. Of what use, then, it may be asked, are "reports" on the subject of medical education, since no attention is paid to them either by colleges, or National or State legislatures. An extensive correspondence has been carried on by your reporter, and many valuable ideas have been presented to him on the subject of his report, but all of them are embodied in previous reports to the Association. A European correspondent suggested the propriety of the national legislature taking the subject in hand, and providing a board of

physicians, to be well paid by the General Government, and to sit for several months at Washington City, for the purpose of examining the graduates of all colleges, before they should be allowed to practise. This would indeed be a great boon to the nation, and a hundred thousand dollars annually expended in this way, would doubtless be the wisest appropriation that Congress could possibly make. But unfortunately the Federal Government has nothing to do with educational matters of this nature, and Congress has no right, under the existing Constitution, to pass any such law. Where then shall we look for support. Is a country whose aggregate of intelligence is greater than that of any nation on the globe—whose wealth is too boundless to be calculated—a country which has done so much for agriculture, for geology, for nautical science, for jurisprudence, and for every other branch of learning that elevates man in the scale of social and intellectual existence—shall such a country be behind all others in its aggregate of medical knowledge, that knowledge on which depends its dearest and most important interests? Before we acknowledge that our humiliating position is without remedy, let this Association exhaust all its resources in endeavoring to devise some means to rectify it.

It is believed that three-fourths of the medical students who fill our numerous colleges, receive their earliest instruction in the rudiments of the profession in the offices of country physicians, and in small villages, where they get a very inadequate idea of *any* branch of medicine. If this large number of students could enter college well prepared, they might receive from two courses of lectures a very respectable share of medical knowledge. All will agree that the subjects embraced in a course of lectures include all that is necessary, and that the various chairs as a general rule are filled with competent professors; but the difficulty is that the students cannot comprehend the largest portion of the lecture, and even if they could, a vast amount of time is wasted on subjects that might be learned before entering college. If the student were well prepared, much of the professor's time might be expended on subjects of a more practical nature. Aware of this fact, a previous report to this Association recommended the establishment of preparatory schools. Much good was expected from the adoption of this plan; but experience has proved that as a general rule it could not be adopted, as it could only be put into operation in towns and cities, thereby effectually cutting off the great number of students from these useful institutions. The idea of a preparatory education was

an excellent one, since it is from this source alone that we are to expect any radical change in our present system. How then is the candidate for admission into a medical college to become prepared to enter with advantage his collegiate course? This is a subject to which your reporter has directed his attention especially, and on which he has reflected a good deal. In conversing about it with a distinguished physician, whose ardor for the elevation of the profession is well known to the country, an idea was suggested which may turn out to be of some practical value.

A great amount of matter which, under the present system, necessarily enters into a professor's lecture, might be learned in the office of the physician, or even in the closet of the student, before he commences a course of lectures. If then he can get an accurate knowledge of this large amount of medical matter, he could devote his collegiate period to a much more extended course of study than he could under other circumstances. The professor would not have to waste time on subjects purely elementary, but could plunge at once into important practical matters, which he is now debarred the satisfaction of doing, because he knows he cannot be thoroughly understood. If, for instance, the student knew the bones accurately, and had a good idea of the brain, the nerves, the viscera, the muscles, &c., how much more time could the Professor of Anatomy spend on the higher branches of this important subject, which must now be hurried over in a manner entirely profitless to the student. Now the bones can be learned as well in the office of the physician as they can in the lecture-room of the professor. While on the bones too, the domain of surgery may be invaded, and a great variety of fractures and dislocations studied with advantage. This would enable the lecturer on surgery to give a much more extensive course in his department. Returning to the chair of anatomy, let us pursue the subject further: a very good idea of the human brain, its structure, substance and so on, may be acquired from the brain of a sheep: a perfect knowledge of muscle, nerve, lungs, liver, intestines and other viscera can be acquired by the dissection of some of the lower animals; and if the student already possessed this information before commencing lectures, how much more time could he devote to those subjects which can be learned only in the lecture-room and at the bedside of the sick.

The course of physiology taught in our colleges, so beautiful, so important, and yet so little instructive to the student, might be rendered ten times more valuable, if he only had time to study and

digest it. But this is impossible, and he leaves college without having acquired much valuable information on the subject, because he could not comprehend the lectures and had not the time to study them attentively. If he had possessed definite ideas on this important branch, the professor would have been saved all the time spent on the elements, and might have given a course at once comprehensive, instructive, and highly valuable to the student. What is easier, under advantageous circumstances, than to get a good idea of a large part of physiology from the lower animals? The dog hungers, thirsts, digests like the man; he breathes with lungs like those of man, his heart beats in the same manner, his liver acts as that of man, his kidneys secrete like those of his master; fatigue tires him; his eye brightens with joy, saddens with disappointment; he is ushered into the world with the throes of his mother, and he dies either by violence or old age, just as does man, the masterpiece of creation. The dissection, therefore, of the dog, and the observation of his functions, would give an insight into physiology at once valuable and instructive. This would be especially the case if such observation were guided by books adapted to the subject.

Let us develop still further this idea by making some reflections on the course of Practice as taught at present in our colleges. It is necessary to spend a good deal of time in the definition of terms, in presenting to the student the various theories, as that of inflammation, for instance, and directing his attention to the changes which take place in the several tissues during an attack of inflammation. This being an important subject, and comparatively new to the large majority of students, it necessarily monopolizes the time of the professor which might be more advantageously given to clinical instruction, and to those portions of the course on Practice which can be learned only in lecture-rooms and hospitals. It were an easy matter for the youth to learn much of this course in the office. The subjects of general and special pathology may be made clear enough by elementary books. The causes of disease, whether atmospheric, telluric, or animalcular, might be explained—the modifying influence of cold and heat, of sleep, and of habit on disease may be learned—the difference between mucous and serous, and muscular inflammations, with their consequences, anatomical and physiological, might be so defined as to be understood by the early beginner. The varieties of fever, the diseases of the nervous system, of the skin, in fact nearly one-half that is now taught in the course on Practice, might be learned before entering college,

and if the student had this knowledge to begin with, he would have just twice as much time to devote to clinical medicine as he has at present. He would then enter on his professional career with much more satisfaction to himself, and decidedly more advantage to his patients. Under the present system, the lecture-room absorbs a great deal of time which should be spent at the bedside of the sick.

The question now arises—From what source is information on all these subjects to be derived? It is true they are all discussed in a clear and practical manner in books already published, but in such books they are so interspersed with other matters, as to be of little value to the student who is just commencing his studies. Another book is needed; a book which will contain in one or at most two volumes, dissertations on the various subjects which enter into the course of medicine. It would be no difficult task for an experienced member of the profession to prepare such a text-book, and there is little doubt that if it met the end proposed, it would have a circulation coextensive with the United States Dispensatory itself. Such a book would find its way into every physician's office, and the four or five thousand students who are annually commencing medicine, would purchase it as the most valuable preparatory work they could possibly procure. It would enable them to learn everything necessary for a thorough comprehension of the lectures delivered in any college in the United States, and would so lighten their collegiate labors that they might devote a large portion of time to those practical matters, which under the present system must be neglected both for want of time on the part of the professor, and for want of capacity on the part of the student.

The prevalent custom in our colleges of granting a diploma after two courses of lectures, although founded on no reasonable basis, still is by common consent a *custom*. All effort to extend the period seems to be in vain. The large number of colleges has awakened a spirit of competition for students, and instead of diminishing, there is every likelihood of this competition increasing. Since then it is conceded by all parties, that two courses of lectures are not sufficient to insure an amount of medical knowledge, which will enable its possessor to practice properly, we must agree that the better the foundation at the commencement of a collegiate course, the more information will be gained by attendance on lectures. Your reporter can think of no plan so well suited to the acquisition of this elementary knowledge, as the one he has proposed. It is novel, but yet it is practical, and it is believed that

the more the subject is dwelt upon by the members of your honorable body, the more plausible it will appear.

If the Association, after deliberate action, think proper to indorse the method suggested, the book in question would no doubt be forthcoming, and its publication would amply repay any author for the time expended in its production. Indeed the Association might appoint some one of its distinguished members to prepare such a book, and this of itself would insure its success. There would be no danger of its not being popular, for its very utility would place it in the hands of every student, and in a very few years the profession would find itself more enlightened, and of course more elevated in the eyes of the nation at large.

Such, gentlemen, is the report. The chairman of your Committee is alone responsible for it, and both its defects and its merits must be attributed to him. It is brief, but it contains all that it is necessary to say. It would have been an easy and an agreeable task to write a long dissertation on medical education and to have recommended plans for raising its standard; but such plans would have been Utopian. The literature of our profession is burdened with papers on this important subject; our own Association contains in its archives several able reports, but though conceived in a spirit of enlightened wisdom, they have not been heeded, because they were mere recommendations requiring more than medical colleges were willing to respond to. The plan proposed may meet with the fate of its predecessors, but such as it is, I respectfully present it to the Association either for rejection or approval.

In conclusion, let me thank the members of the Association for the distinguished honor conferred on me, in appointing me chairman of this important committee, and in continuing my post for a second year. I have not been unmindful of the public interest. I have thought much, and corresponded much, in order to present a report which would carry with it some practical suggestions. Every method suggested to me, however valuable in itself, bore upon its face impracticability, and I have withheld many ideas, which in a government different from ours might have been highly valuable to the profession. That the plan herewith reported may do something towards elevating the standard of medical education, and increasing throughout our great country the aggregate of medical knowledge, is the highest ambition to which I aspire.

WM. HENRY ANDERSON,
Chairman.

REPORT

ON THE

MEDICAL TOPOGRAPHY

OF THE

EASTERN SHORE OF MARYLAND.

BY P. WROTH, M.D.

REPORT ON THE MEDICAL TOPOGRAPHY OF THE EASTERN SHORE OF MARYLAND.

THE undersigned, the member for Maryland of the general Committee appointed by the American Medical Association on the "Medical Topography and Epidemics of the United States," in obedience to the duty assigned to him, respectfully reports—in part.

Having failed in a great degree in his efforts by circulars and by urgent applications to professional gentlemen in every corner of the State, to procure satisfactory materials for a full report, he finds himself, near the close of the year, under the necessity of restricting himself to the eight counties on the Eastern side of the Chesapeake Bay. In the dearth of information from the profession, he will limit himself to the *Medical Topography*, and leave the *Epidemics* of Eastern Maryland for a future report.

All that part of the State of Delaware which embraces the counties of Sussex and Kent and includes the southern part of New Castle County which lies below the Delaware and Chesapeake Canal; all the counties on the Eastern shore of the Chesapeake, with the exception of that part of Cecil County lying north of said canal, and the two counties of Accomack and Northampton, belonging to Virginia, and lying on the east of the Chesapeake Bay, constitute a district of country which is called "The Peninsula." A line running through the centre of this peninsula north and south divides the State of Delaware from the Eastern Shore of Maryland.

Through the length of the Peninsula, commencing in the vicinity of the village of Warwick, in Cecil County, and extending to the southern extremity of Worcester County, is a swampy level or table-land, which is called the Forest. In this swamp, or forest, though to the eye of an observer on the spot it presents a surface uniformly low and level, covered with an abundant growth of tim-

ber embracing all the varieties of oak, with chestnut, maple, gum, and other trees, arise the head-waters of all the streams which flow into the Delaware Bay on the east, and into the Chesapeake on the west. It is the watershed of the Peninsula—and it is worthy of notice that while Eastern Maryland is abundantly watered by more than a dozen bold and navigable rivers with their numerous navigable tributary creeks, the State of Delaware, below the town of New Castle, can boast of but one watercourse which aspires to the name of *River*, and of only three or four creeks which are passable by small steamers and sail-boats.

The region known as the Eastern Shore of Maryland, is bounded on the north by Mason and Dixon's Line; on the east by the State of Delaware; on the west by the Susquehanna River and the Chesapeake Bay, and on the south by Accomack County, in Virginia. It embraces the counties of Cecil, Kent, Queen Anne's, Talbot, Caroline, Dorchester, Somerset, and Worcester.

CECIL COUNTY.—The topographical aspect of the northern, north-western, and north-eastern divisions of this county differs essentially from that of the eastern and southern. In the former the surface is hilly—especially on the Susquehanna, where the bluffs are bold and precipitous. In the latter, it is comparatively level, while the watercourses are deeper, broader, and navigable. The whole county is covered with alluvial deposits of the tertiary geological era. Along the Susquehanna and the line which divides Cecil from Pennsylvania, the underlying and outcropping rock is igneous, especially about Port Deposit (a town on the east bank of the river), where large quantities of granite are annually shipped as a building material. The county lies between the Susquehanna on the west, Pennsylvania and Delaware on the north and east, and the Sassafras River on the south. It is traversed by rivers which are navigable by grain boats of 50 to 100 tons, nearly to their sources. On the streams which are the head-waters of the rivers which empty into the bay, dams have been erected to create water-power for mills.

Beginning at the south side of Cecil, we have the Sassafras, which has high banks near its entrance into the Chesapeake—but farther up it is bordered by low grounds and marshes. The streams which feed it rise in Delaware, in the great Forest mentioned before, and drive mills on each side of the Head of Sassafras, a village at the head of tide-water.

Advancing from the Sassafras northward, we come to the Bohemia River, of which there are two branches, the Big and Little Bohemia, on the head-waters of which (which rise in Delaware) are situated mills which are employed in the manufacture of woollen cloths and grain.

The Chesapeake and Delaware Canal, which unites Chesapeake and Delaware Cities on the shores of their respective bays, is partly fed by the waters of Back Creek.

The Elk River, on the head of which stands the Town of Elkton, the seat of the courts for the county, flows into the Chesapeake Bay at Turkey Point. The tides come up to the town, where, during the ebb, is seen a large extent of marshy land frequently left bare. This locality, which from *prima facie* evidence we should judge to be the native home of autumnal fever, has been for many years almost exempt from such visitation. I have this information from an intelligent gentleman of Elkton, on the authority of a late eminent physician, Dr. Evans.

Elk River is fed by two streams, Big and Little Elk. The former rises in Chester County, Pennsylvania, thirty or forty miles above Elkton, and, passing through fine meadow lands and an extensive tract of fertile country, falls into the Elk River to the east of the town. Towards Newark, in Delaware, the prevailing rock is a ferruginous sandstone, and iron ore is abundant. Little Elk rises in a tract of country called White Barrens, in Pennsylvania, and passing through fine bottom lands empties into the river on the west of Elkton. Both of these fine fresh-water streams afford abundant water-power and drive many mills where iron, cloth and grain, are prepared for market. The land between these streams is hilly, and highly esteemed for agricultural purposes.

The North-East River falls into Chesapeake Bay at the village of Charlestown. At the head of tide-water stands the town named after the river North-East, where the two branches called Big and Little North-East unite to form the main river. Here stands a mill, and here the ebb of the tide leaves many acres of mud exposed, without the shade of a rush or blade of grass, to the sun's rays.

The Big North-East rises near Oxford, Pennsylvania, and runs through twenty miles of fine bottom lands. It has a succession of rapids or falls affording great facilities for manufacturing establishments. The Little North-East rises near the brick Meeting-house in Pennsylvania. The northern part of its course is through a hilly

country, while in its southern it passes through low and more level lands with a deep, rich, alluvial soil.

The Octorara Creek has its source in Chester County, Pennsylvania, and for some distance divides that county from Lancaster. In the lower part of its course it divides the latter from Cecil County, and thence passing through Cecil falls into the Susquehanna.

The Connewingo rises in Chester County, and is connected with the Octorara by a canal, and with it falls into the Susquehanna.

Principio Creek, which falls into Chesapeake Bay below Havre de Grace, passes through an undulating and fertile country.

Besides these there are numerous small fresh-water streams which run into the rivers and their tributaries. The necks of land, especially those between the Sassafras and Bohemia Rivers and between the latter and Elk River, are remarkable for a fertile soil and easy culture. Timber of various species is abundant and fine. The soil is an alluvial deposit consisting of a happy mixture of silicious and argillaceous earth with abundant decomposed vegetable matter, and is very productive in the cereals and other agricultural objects. On all the rivers in which the tides of the Chesapeake flow, there are low grounds and marshes alternating with higher grounds.

All that portion of the State of Maryland which lies between the State of Delaware on the east and the Chesapeake on the west, presents to the observer a population, with the exception of the upper part of Cecil County, of almost unmixed Anglo-Saxon paternity. Lying out of the line of great intercourse between the northern and southern extremities of the United States, suffering under a long established character, now partially redeemed, of being a region where malarious fever delights to dwell, and consequently affording slender inducements to emigrants, little intermixture of other races has occurred until recently. The increase of improvements consequent on the general introduction of lime and guano as fertilizers has brought more land into cultivation by the draining of low grounds and marshes and the clearing of woodlands. Hence an increased demand for labor. This demand, in consequence of the great increase of the free black population which has resulted in disappointing the calculations of the benevolent individuals who have manumitted their slaves with a view to their benefit, has attracted many of the Celtic and Teutonic races to settle among us. This new element in the population of the peninsula has been productive of no melioration in the moral habits, domestic qualities, or social feeling of our population, and is yet too small, perhaps, to exercise a very

decided influence on its nosological history, unless such influence may be recognized in the great increase of typhoid fever.

In taking leave of Cecil, it may be observed that the prevailing rock, especially from Port Deposit up the Susquehannah, is granitic, while more inland it is chiefly sandstone. A line drawn from Port Deposit eastward to Delaware divides the secondary geological era from the more recent tertiary and alluvial formations.[1]

KENT COUNTY.—This county is bounded on the north by the river Sassafras, which divides it from Cecil, on the east by a line through the forest which separates it from Delaware; on the south by Chester River, and on the west by the broad and beautiful Chesapeake. The head-waters of these rivers have their source from the same swampy level, commonly called "the forest," which constitutes the water-shed between the bays, and in which all the rivers which flow into the Delaware Bay on the east and the Chesapeake on the west, have their origin. This forest commences near the village of Warwick, in Cecil, and runs through the whole peninsula, giving origin to many rivers hereafter to be mentioned, and affording great facilities for intercourse with our great commercial metropolis in grain and lumber, and indeed every variety of agricultural products.

From Belle Air, a small village some miles from the bay, to Chester Town, and thence to the head of Sassafras, the principal road is on a ridge of slightly elevated land, on each side of which rise the streams which run into the rivers and their tributary creeks. The following creeks—Still-Pond Creek, Churn, Worton, and Farley empty into Chesapeake Bay. Langford's Bay Creek (of which there are three navigable branches), Gray's Inn, Church, Tavern, Swan, Radcliff, Morgan's, and Prickly Pear, run into Chester River —and Turner's, Lloyd's, Freeman's, and some smaller streams flow into the Sassafras. Nearly all of these are navigable by grain-boats which trade with Baltimore, and through the Delaware and Chesapeake Canal, with Philadelphia. They pass through low, marshy ground—and on their head-waters, at the head of tide-water, dams have been thrown to create water-power for mills.

The topographical aspect of Kent offers to the observer an agree-

[1] For much valuable and entirely reliable information concerning Cecil County I am indebted to my friend Mr. Wiley, of Chester Town, a gentleman who lived many years in that county and is well acquainted with its topography.

able variety of hills and plains, the highest elevations not exceeding 60 to 80 feet above the tides, and presents a pleasing alternation of woods, meadows, and arable lands. On the borders of the rivers there are extensive marshes, covered with coarse grass, flags, &c., which thrive in salt water, by which they are frequently inundated. The long necks between the creeks are for the most part low and level, elevated but little above the water, and the soil consists of loam in which clay predominates. This is especially the character of Eastern neck, included between Chester River on one side, and Gray's Inn on the other; Rock Hall and its vicinity, near the head of Gray's Inn; Pine Neck between Gray's Inn, and the west branch of Langford's Bay; Broad Neck between the branches of Langford's Bay and Chester Neck, commonly called Quaker Neck, which lies between the east branch of Langford's Bay and Chester River. In these necks, white oak and pines are chiefly seen, though chestnut sometimes appears. In the middle and upper parts of the county, white, red, black, Spanish, swamp, and willow oaks, chestnut, walnut, hickory, poplar, maple and other trees are found abundantly. Few districts of the Atlantic States have a finer growth. The soil is alluvial, some parts argillaceous, in others arenaceous—and all susceptible of the highest improvement for the production of grain. The alluvial loam rests on a substratum of tertiary clay generally colored by a ferruginous ingredient—but sometimes resembling pipe-clay or Fuller's earth.

On the shores of the Chesapeake, Chester River, Worton, Farley and other creeks are found many extensive collections of shells, in a state of partial disintegration, on localities which tradition points out as the sites of aboriginal towns or villages. Many of these shell-banks are so deep and so extensive in area as to lead some to conjecture that they are of submarine origin. But the absence of all species of shells, except the oyster, the fact that they are all found open, the occasional occurrence of the bones of the deer, bear, raccoon, and opossum, and the presence of the stone axes and arrow-points of the aborigines, with collections of half-burnt billets of wood, found beneath the deposits, sufficiently prove that these shell-banks were not formed under water. The magnitude of these collections will cease to surprise us when we consider that the whole aboriginal population between the Delaware Bay and the Alleghany Mountain drew their subsistence entirely from the forests and waters, by hunting and fishing, for more than a thousand years.

In Kent County there is but little calcareous marl. It is found

in limited quantities on the banks of Chester River, a few miles below Chester Town, but so intermixed and imbedded in masses of ferruginous sandstone as to be of small value. The former State Geologist, Professor Ducatel, of the Baltimore Medical College, invited the attention of our farmers to their inexhaustible deposits of tertiary green sand and micaceous black sand, which are silicates of potash. The latter, large beds of which are found below a thin stratum of ferruginous sandstone on the farms bordering on the high banks of Lloyd's and Churn Creeks, contains numerous univalves—and the green silicate found abundantly on the Sassafras River, on the farms of Joseph Griffith, Eben Welch, and Edward Wilmer, Esqrs., closely resembles Jersey marl, and like it has been profitably applied.

In some localities on the above-named lands, and others in the neighborhood, a rich calcareous marl is found in abundance.

The whole county, indeed the whole peninsula, is entirely free from any strata of solid rock, with the exception of a few localities where a thin lamina of ferruginous sandstone in the process of formation is found. Silicious boulders may indeed often be found scattered over the surface and imbedded in strata of clay and sand beneath the surface. On the shores of Chesapeake Bay are seen abundant colluvies of rounded, water-worn, silicious pebbles with occasional boulders of conglomerate and hornblende. But these latter are not natives, but have evidently been brought down the Susquehanna from more primitive regions on fields of ice and there deposited.

The bluffs on the bay, in some places bold and precipitous, especially in the vicinity of Worton Point, rise to an elevation of from 20 to 60 feet above the highest tides. The face of these high banks or bluffs exhibits alternate strata of sand and clay of various colors, with a covering of decomposed vegetable matter at the top. One of these strata is a red, ochreous clay, unctuous to the feel, and strongly impregnated with oxide of iron. Here also is found an abundance of martial pyrites, some in amorphous masses and some beautifully crystallized—and at the bottom of banks 50 to 60 feet high, are seen numerous branches and some bodies of trees converted into lignite—the first stage, according to Sir Charles Lyell, an eminent English geologist, in the formation of anthracite.[1]

[1] Some remarks here introduced, it is acknowledged, bear a more intimate relation to Geology than to Medical Topography.

In most parts of the county are streams of fresh water, the head-waters of creeks, on the low grounds near which is a dense growth of alder, hazel, spicewood, magnolia, and other shrubbery. Fine springs of soft water abound along these streams. On all these meadows and swamps there is an abundant growth of vegetation. In the neighborhood of these watercourses and the mill-ponds which they feed, we have frequently had abundant *crops* of autumnal fever—and whether this fever, appearing from July to November, be produced by carburetted hydrogen, or other noxious gases, by the sporules of the cryptogamia, or by animalculæ floating in the air, these localities seem to be specially adapted to its development. Of late years, however, autumnal fever has evidently been on the decline—and for the last three years the autumnal months have been as salutiferous as June, which Dr. Rush called "the resting month of febrile diseases." I feel unable to account for this declension, but venture to suggest that the cause may be found in the improved culture of the soil, in more extended drainage of low grounds, and the almost universal spreading of lime over the surface.

The towns of Kent County are Chestertown, on the east and west sides of which are large marshes with coves from the river. It is the most ancient town on the Eastern Shore, and the seat of justice; Georgetown on the Sassafras, and near it the village of Georgetown X roads; Millington on the head of the tide of Chester River. It stands in a sandy basin, the neighboring lands both on the Kent and Queen Anne shores being somewhat more elevated than the site of the town; New Market, a mile from Chester River, and the head of Sassafras, which is almost surrounded by mill-ponds and marshes. No physician can look on these places without thinking of calomel and quinine.

QUEEN ANNE COUNTY.—The boundaries of this county are—Chester River on the north—the State of Delaware and part of Caroline County on the east—the Wey (Wye) River on the south, and the Chesapeake Bay on the west. Queenstown Creek, Reed's, Corsica, South-East, and Double Creeks empty into Chester River in the order in which they are named, reckoning from the mouth of it. Two or three of them are navigable a few miles by small boats. Queenstown stands on the creek of that name and Chester River: Centreville, the county seat, on the head of Corsica, on the head-waters of which are mills: Church Hill is built on the head of South-East, and there also is found that indispensable appendage

to all streams of sufficient size—a mill. Double Creek is not navigable, but has large marshes from mouth to source, and has not arrived at the dignity of being the site of a town, unless we so name "Rough and Ready," a hamlet of wood-choppers near its head.

The north side of this county from South-East Creek to Millington, along Chester River, is almost unmixed diluvial sand, clothed with pines and sterile, producing only small returns to the farmer for his labor, of Indian corn and rye. A large portion of the eastern side of this county is a swampy level, very sandy, and unproductive. To the east of Church Hill for a few miles are found inexhaustible deposits of marl, rich in calcareous matter. The lands in the vicinity of these marl beds are improvable and improving.

The long marsh commences in the eastern part of this county, in the forest, the source of so many streams, and running south until it reaches Caroline County, becomes the dividing line between the two counties by a large ditch (cut through the marsh) which empties into Tuckahoe Creek, a tributary of the Choptank River, below Hillsborough. In Tuckahoe Neck is much fine land. The whole tract of country about the Long Marsh, Boonsborough, Beaver Dams, and Templeville is fruitful *in the production* of the autumnal bilious fever. The parts about Templeville (formerly called Bullock's Town) and vicinity of the Delaware line are well supplied with timber, and embrace lands of medium quality. The middle and lower parts of the county from Centreville southward, and especially about Queenstown, Wey River and Kent Island (an island of the Chesapeake, belonging to Queen Anne County, 20 miles long and 3 to 6 broad), the lands are mostly level, sometimes gently undulating, and very productive in the usual crops. The lands on Wey are equal to any in the State or any State.

The face of the country and the general character of the soil, with the exception of the south side of Chester, which has been noticed as unmixed sand, resembles that of the adjoining county of Kent, being a loamy alluvium, or mixture of sand and clay, with decomposed vegetable matter on the surface, and susceptible of the highest improvement. On and in the neighborhood of all the marshes, creeks, and mill-ponds about Church Hill, Centreville and Queenstown—on Wey and the smaller streams flowing into it, we have a malarious region, where autumnal fever and all its sequelæ abound. The swamps and marshes are everywhere bestrewed with

large quantities of rubbish, grass, sea-ooze, and brush floated up by high tides and branches of trees, in all stages of decomposition. Where, if not in such localities, may we expect to find bilious fever?

TALBOT COUNTY.—This county has Wey River for its northern, Caroline County for its eastern, Chesapeake Bay for its western, and Choptank River for its southern boundary. Wey[1] and Miles Rivers, embracing Miles River Neck,[2] have their sources within a short distance of each other in the same forest, which gives rise to all the rivers on the western slope of the peninsula. They empty into one common estuary called the Eastern Bay, which is an arm or gulf of the Chesapeake. They are broad and navigable streams, and into them the tides of the Chesapeake regularly flow nearly to their sources.

A rather singular feature of these rivers is—they have no marshes contiguous to them. The land either slopes gently to meet the water, or rises in precipitous banks to an average height of 10 or 12 feet. The peninsula formed by these rivers and the bay, is situated between the 38° and 39° of latitude, and is 1° 30′ east from the meridian of Washington. It is about 10 miles long, and its area about 40 square miles. Its general elevation is about 10 feet above tide-water, which rises and falls about 3 feet, leaving at the ebb a considerable extent of the margins of the rivers uncovered. The shores consist of a hard, white sand, and it is only in the indentures leading into the land, that a muddy deposit is found.

Encroachments are annually made on the river banks by the combined action of rains, frosts, high tides and hard winds, and the loss of firm land by these causes has been estimated at one foot per annum. It is the sand and silicious pebbles washed from the shores and soon deposited, that give to the shores their firm, sandy character, while the lighter aluminous and vegetable portions are held longer in suspension and carried further out into the water, thus preventing a marshy formation on their shores. This topographical feature contributes greatly to the beauty of the Neck, and doubtless to its salubrity.

Many small creeks and coves make into the land on both sides of

[1] This is most commonly spelled Wye.

[2] For this account of Miles River Neck, I am entirely indebted to A. M. White, M. D., a gentleman justly esteemed for literary attainments and professional eminence.

the neck, exhibiting in miniature the general features of their parent streams.

It is a peculiarity of all narrow necks of land between salt water streams that they have no central dividing ridge, and the elevation near the rivers being somewhat greater than in the central portion, the difficulty of draining is of course increased. The geological character, too, of the central portion differs from that near the shores of the rivers. The former is a tenacious heavy clay containing an admixture of finely comminuted sand and so compact as to be almost impervious to water, thus forming, where there are depressions on the surface, pools of water (from rains) which remain until evaporated. The land near the shores consists of a light friable loam in which a coarser sand predominates. The vegetable productions, too, near the shores differ from those more in the interior, many species of cryptogamic plants or fungi being found to flourish in the latter, while they are seldom seen in the former.

Springs of pure water are found along the margins of the rivers and creeks, and the water of wells in the vicinity of the streams is equally pure. But springs rising inland frequently hold in solution sulphurous, ferruginous, or saline ingredients.

The temperature varies, during the summer, from 50° to 90°, in the spring, from 30° to 60°, in winter, from 0 to 45° of Fahr. In the autumnal months the temperature is most equable, the thermometer ranging from 30° to 50°.

Of the hygrometrical conditions of the atmosphere, Dr. White observes that he is not able to give any precise memoranda. He has often seen, when riding in calm summer nights, a dense fog resting on a portion of the surface when all around was clear: these fogs do not appear to be solely owing to lower temperature, for on entering them, one is often sensible of a stifling and unpleasant warmth. Nor does the elevation above the tide seem to be the sole cause of this irregular distribution of moisture, for fogs are often seen hanging over slightly elevated situations, while lower grounds in the vicinity seem to be free from them. It is therefore rendered extremely probable that some terrene condition is necessary for their production.

All the eastern part of Talbot County, extending from the headwaters of Miles and Wey rivers to the Choptank, is more or less swampy, with farms in the clearings of inferior quality for agricultural products. On and near the Choptank the soil improves, being

a light loam, in some parts with an excess of arenaceous, and in others the argillaceous ingredient predominating.

In many parts of Talbot are found inexhaustible deposits of calcareous marl. The town of Easton is built on a marl bed, but little below the surface, and in many localities on the Choptank River, the marl is abundant and rich.

The Choptank River rises in the Great Forest on the borders of Delaware, and running by Greensborough and Denton, much of this distance through a region of deep, unmixed sand, it passes by the place called Dover, where, a few years ago, it was spanned by a bridge, now in ruins, and extends its somewhat winding course by Cambridge and Oxford into Chesapeake Bay. The principal tributary of this large river is Third Haven (sometimes spelled *Tread* Haven), which has many branches running up into the county which carry grain-boats to numerous farms. West of Third Haven is a considerable stream called Broad Creek, navigable for vessels, watering with its branches a large portion of the west of the county. It falls into the bay just above Tilghman's Island.

The necks between these creeks and their branches, as Oxford Neck, Bailey's Neck and others, embracing the western parts of the county from the mouth of Choptank River to the Wey (Wye) and including the bay-side, contain lands which are noted for their fertility.[1] The soil is chiefly a rich argillaceous loam, constituting what is known as white oak lands. This whole extensive region, with the exception probably of the bay side, which is comparatively salubrious, is a malarious country having numerous and extensive low grounds and marshes. Autumnal fever prevails more or less every year, excepting at Oxford, a small but ancient town at the mouth of the Choptank. This place being surrounded by deep sands (which produce a very sparse vegetation), and the broad estuary of the river, is a place of resort for families in Easton and other parts during the autumnal months for health. The vicinity of the Royal Oak between Easton and the bay side, is remarkable for its salubrity, and can show, it is believed, more instances of longevity than any part of the Eastern Shore.

In the bay are Tilghman's Island and Poplar Island, opposite the coast of Talbot County, to which they geographically belong.

[1] The banks of the Third Haven, particularly on the north side of Bailey's Neck, are high and precipitous, as at the estate of Thomas Hayward, Esq.

DORCHESTER COUNTY.[1]—This county is bounded on the north by the Choptank River and a part of Delaware State; on the south and east by the Nanticoke River and Delaware, and on the west by Chesapeake Bay.

The River Choptank, sometimes called Great Choptank, has many tributary creeks, the largest and deepest of which is the Third Haven, before mentioned as on the north or Talbot side of the river. Advancing south from this we meet with Little Choptank, the length of which does not exceed five or six miles from its mouth, where it empties into the bay. The next river going south is, Transquakin, the course of which is short, and it deserves little notice but for the fertile lands on its banks. The soil is a good loam, or mixture of clay and sand, due proportions of which ingredients, with its covering of decomposed vegetable matter, constitute our richest lands. Near to this is the Chicnicomico, which is also a short stream and navigable by only very small boats. The shores of both are marshy, and both fall into Fishing Bay, the estuary of Nanticoke River.

Hungary River is farther south, but within the bounds of Dorchester County. It is only navigable for a short distance. It passes through a district which consists chiefly of a white, or pipe-clay, but is in some places sandy. Its general character is argillaceous, the surface level, and the shores extensively marshy. It empties into Hooper's Straits.

The Nanticoke is a bold, long, deep river, and is navigable about a hundred miles from its estuary, in Tangier Sound. It has its source in the Great Forest, on the Delaware side of the line which divides that State from the Eastern Shore of Maryland. The upper part of the course of this river is through an almost continuous region of deep sand covered with pines—and the lower part through endless marshes until it reaches the sound. It is the longest of the peninsular rivers.

On the Dorchester side of the Choptank there are many creeks.

Upper and Lower Hunting Creeks, the former of which divides this county from Caroline, as far as its course extends. On the head-waters of both are mills.

Secretary Creek empties into the Choptank, about twelve miles

[1] For the topographical details of Dorchester, Somerset and Worcester Counties, I am chiefly indebted to my Rev. friend Francis Waters, D. D., Principal of Washington College in Chester Town, who was born on his father's estate on Quantico in Somerset, and is intimately acquainted with the whole region.

above the principal town, Cambridge, and near it stands the town of New-Market, about two miles from the river.

Cabin Creek empties into the river about fourteen miles above Cambridge. The growth of timber on these creeks and rivers, is chiefly pine and oak, the former predominating, and the whole region watered by them is low. The eastern part of Dorchester, and indeed of all the counties below Cecil, is a sandy forest, which, as it extends along in a southern course, gives origin to all the peninsular rivers. There are other smaller creeks and coves making up into the county, which only require to be noticed as the means of augmenting the area of low, moist, and marshy grounds, and thus adding greatly to the abundant sources of autumnal fever.

From Cambridge, a handsome town on the south, or Dorchester side of the river, in the direction of Church Creek (a town thus called), and Tobacco Stick (another town!), the soil is, with a few local exceptions, a stiff, heavy, white oak, pipe-clay level. A few miles from Vienna, which stands on the Dorchester side of the Nanticoke, is Ennalls's Spring, which is celebrated for a copious supply of cool fresh water.

On all these rivers and creeks are marshes, more or less extensive, and abounding in mosquitoes. These marshes are seldom found on both sides of the streams at the same points of their courses, but alternate from side to side, the water in its windings touching the uplands and affording good landings for boats, and thus greatly increasing the facilities of shipping grain and lumber to the commercial depots.

It is a remarkable feature of all this region, from Chester River to the lowest watercourse on the Eastern Shore, that the southern banks of the rivers consist of a deep, almost unmixed diluvial sand, while the opposite, or northern sides enjoy a soil of much higher fertility, in which the aluminous principle predominates. There is the same remarkable difference in their productiveness—the one affording small returns of rye and Indian corn, the other much finer crops of wheat and corn, the two great staples of the Peninsula. On the south sides the timber is chiefly pine; on the north sides the growth consists of all the varieties of oak, hickory, chestnut, maple, walnut, gum, &c.

The islands in the bay, and which, geographically, belong to Dorchester County, are:—

1. Sharp's Island. On this the land is low, with considerable wood and a proportion of arable land.

2. Barren Island—very low, but little above the tides, and abounding in pine woods.

3. Hooper's Island—is well inhabited, though low and level. All these islands are to some extent marshy.

The towns are Cambridge—the metropolis—East New-Market, Church Creek, Tobacco Stick, and Vienna.

SOMERSET COUNTY.—This county is bounded on the north by the Nanticoke River and the Delaware line; on the east by Worcester County; on the south by Pocomoke Bay and River, which divides it from Worcester County; and on the west by Tangier Sound.[1] On the Somerset side of the Nanticoke, are:—

1. Wittipkin Creek, navigable only a short distance.

2. Quantico Creek, which is quite a bold navigable stream, and has some fine estates on its banks.

3 and 4. Rewastico and Barren Creeks, both navigable a few miles by lumber and grain boats, and both pass through a sandy region. On the latter, are the Barren Creek Springs, which afford a large supply of sulphuro-chalybeate water. In former years these springs were much celebrated; but the country around being flat and sandy, is not very attractive as a place of resort for valetudinarians, though the water is unquestionably good. There are extensive and valuable beds of bog-iron in the vicinity.

On all these waters the necks are very productive in the cereals, and on all are extensive marshes.

Wicomico River rises in the swampy tract of forest land, before noticed, and within the bounds of the State of Delaware. It runs through Somerset County and falls into Tangier Sound—an arm of the Chesapeake, which separates Tangier and other islands from the main land. It is a fine bold stream, admits vessels of considerable tonnage, and in common with all the watercourses on the western slope of the Peninsula, receives the regular diurnal tides of the Chesapeake almost to its source. The Wicomico Creek is a deep and navigable tributary of this river—as also is the Monie Creek. South of Wicomico River is the Monokin River, which passes through the county, and empties into the same sound. It rises in the Forest of Somerset, and has for its tributaries, St. Peter's, King's, and Back Creeks.

[1] It is about 45 miles in length from north to south, by about 30 from east to west, covering an area of about 1300 square miles.—S. K. HANDY, M. D.

Great Annamessex River rises in the Forest, before named, passes through the county, and empties into Tangier Sound. It has several small streams as tributaries—as Curtis's, Hall's, and Clara's Creeks. Here is also a smaller river, called Little Annamessex, which, in like manner, empties into Tangier Sound.

An arm or gulf of this river, which has obtained the name of Moon's Bay.

On the east of Annamessex, we have:—

Williams's Creek, so named from the family of Dr. Williams, who, for a century or more, have had fine estates on its banks. There are, also, Colbourn's and Jones's Creeks, on the same river. Marumsco Creek falls into Pocomoke at its mouth.

The Towns are: 1. Princess Anne, which stands on the head of Monokin River, and is the metropolis of Somerset. 2. Salisbury,[1] on the Wicomico, a great mart for the lumber trade. 3. Quantico—on the creek of that name. 4. White-Haven, on the Wicomico, whence steamboats *paddle* to Annapolis and Baltimore; and 5. Rehoboth, a village on the Pocomoke. This place is remarkable as being, it is said, the site of the first Presbyterian church ever built south of Philadelphia. This ancient edifice is still standing, and in it some Presbyterian families still worship, under the care of a regular pastor. About and above Rehoboth, the surface of the country is somewhat more elevated, presenting some good and improvable lands, generally of an argillo-arenaceous character, on and near the watercourses, but more clayey in the interior. The lands near and at the sources of all the streams are level, swampy, and sandy. In the necks between them the clay soil predominates, and it is generally productive in wheat, Indian corn, and other crops.[2]

[1] "The whole country, for many miles around Salisbury, is, with few exceptions, a light sandy soil, which embraces from a fourth to a third of Somerset County. There is very little appearance of clay in this sandy region. It is found in the subsoil, two or three feet below the surface.

"On the watercourses, the banks are somewhat elevated. The streams generally flow in narrow channels—and generally drain the country. There is no stagnant water except in the swamps—but the recent rise in the value of lands has induced owners to adopt a system of drainage which brings these swamps into cultivation."—C. HUMPHREYS, M. D.

[2] "As the main bodies of water approach the Chesapeake Bay, they widen greatly, and the amount of marshy district is vastly increased. From certain points in the western limits of this county and near the shores of the bay, the eye may extend over thousands of acres of marsh, without an obstacle to interrupt

The islands opposite to, and in part belonging to Somerset, are Holland's, Smith's, and Tangier, lying in the order in which they are named, between Tangier Sound and Chesapeake Bay. They are marshy and have but little wood, but in isolated spots there is some soil well adapted to the growth of Indian corn and sweet potatoes.

CAROLINE COUNTY.—This county is bounded on the north by Queen Anne County, east by the State of Delaware, west by Queen Anne and Talbot Counties, and on the south by Dorchester County.

The principal watercourse is the Choptank River, which has before been mentioned. This river has several tributaries, of which the chief are: 1. Tuckahoe Creek, which empties into the river below Hillsborough, dividing Caroline from Talbot County, and Watson's Creek, falling into the Choptank, on its east side, and rising in Delaware.

The lands in Tuckahoe Neck are a rich loam—and east of the river, eight or ten miles inland, are some soils in which clay is the predominant ingredient, constituting white oak land. With these exceptions, and a few other localities in the necks, the lands from Greensborough to Denton, and thence to the Delaware and Dorchester line, are almost pure sands, producing scrubby pines, and short crops of rye, Indian corn, and peas. On all the waters are low grounds, with some extent of marsh, and autumnal fever prevails every year. The river and creeks, particularly Tuckahoe, abound in fine fish.

vision. In many places are isolated ponds, or small lagunes, from a few to one hundred feet in width, only containing water—which remains until evaporated. In times of long continued drought, these ponds dry up, leaving the bottom covered with a dark green scum, filled with myriads of animalculæ."—Dr. HANDY.

"On evenings and nights there is a very strong odor of sulphuretted hydrogen.

"The marshes are traversed by small streams (or guts, as they are called), meandering through them for many miles before they empty into the rivers. The beds of these coves, at low water, are exposed bare to the sun."—Dr. HANDY, of Princess Anne.

"Medical Topography and Physical Geography are nearly allied—and, like Chemistry and Natural Philosophy, run into each other. When we consider the sources of disease as divided into two great classes—the one from external and atmospheric impregnations—the other from temperament, constitution, habit, &c., we see the almost endless sources of disease."—C. HUMPHREYS, M. D.

WORCESTER COUNTY.—This is the last and most southern county on the eastern side of the Chesapeake Bay—has the State of Delaware (Sussex County) on the north—Accomack County, Virginia on the south—Somerset County on the west, and the Atlantic Ocean on the east.

Pocomoke River rises in Sussex County, Delaware, in the great Cypress Swamp, and passes through the whole of Worcester County from the northeast to southwest, diagonally. This swamp is the southern part of the Great Forest, and gives rise to Indian River, which runs east into Delaware, and falls into the Atlantic. The Pocomoke falls into Pocomoke Bay, and has several navigable branches or creeks. 1. Dividing Creek, which separates Worcester from Somerset County; 2. Queponco; 3. Nasuango, which falls into the Pocomoke below Snow-Hill; 4. Bennett's Creek. North of Bennett's and Queponco commences the great Cypress Swamp, which runs up to, and occupies a large tract in Sussex County, Delaware. The Cypress timber is found abundantly on the above named creeks, and also on Pocomoke River, more or less throughout its whole course. The soil of the Cypress Swamp is a rich, deep, black mud, so saturated with moisture that if an excavation of a few feet be made in any part of it, it will be soon filled with sweet, cold water. When cleared of the timber and properly drained, the soil is exceedingly productive. Immense quantities of Cypress shingles and staves are annually shipped down the Pocomoke and up the Chesapeake Bay, to Baltimore and other ports.

St. Martin's River, on the northeast part of the county, runs into St. Martin's Bay, and thence into Sinepuxent Bay, at the head of which are several arms or gulfs, running into the interior of the county. Some creeks flow into the west side of the Sinepuxent.

Worcester County, through this whole region, embraced by the above named creeks, the upper Pocomoke and Sinepuxent, and also from Dividing Creek to Snow-Hill, is level and sandy. East of Snow-Hill, the Metropolis of the county, which stands on the banks of the Pocomoke, the lands are of good quality, and show some fine estates. The lower part of the Pocomoke passes through marshes; and the general aspect of the country presents an extensive level of deep sand, having a growth of pines.

The Cypress Swamp is the watershed of that part of the Peninsula, the waters running east into the Delaware Bay and Atlantic Ocean, and west into Chesapeake Bay. The towns are, Snow-Hill, New-Town, Berlin, and Poplar-Town.

CONCLUDING OBSERVATIONS.—The Eastern Shore of Maryland has not been held in that estimation which its topographical aspect, agricultural advantages, and commercial facilities should command. With the exception of its sandy levels, which, when compared with its whole area, bear only a small proportion, the lands are now very productive in our staple commodities, wheat, rye, Indian corn, oats, and lumber, or may be easily made so, by the application of lime and judicious rotations. Until recently, few farmers paid much attention to manuring, and most of the lands had been much reduced before the improved system of farming commenced.

No part of the United States offers so few impediments to the plough. Not a rock encumbers the surface of the ground. The Peninsula, being almost equidistant from the Atlantic Ocean on the east, and the Alleghany Mountains on the west, enjoys an equability of temperature seldom witnessed in similar latitudes. The last forty years would not show an average of six inches of snow annually. It is a rare occurrence that an early frost nips the growing crops before maturity. Perennial springs of the purest water, and the streams which they feed, are everywhere found. Broad, deep, navigable waters bring a market to almost every farmer's landing. Many forms of epidemics, in consequence of our isolation from the great thoroughfare of travel from east to west, and from north to south, seldom visit us. The endemic fever of autumn is generally mild and amenable to treatment—and above all, the purity of the race, being Anglo-Saxon in its origin, is displayed in its comparative exemption from the vices and immoralities so universally prevailing in mixed populations. The character of the people—their cordial, open-handed hospitality, has become a proverb. Disdaining the crowded city, the Eastern Shore gentleman resides on his ancestral estate, his door ever open, and his heart responding to feelings of expanded benevolence.

But I will stop here. The Committee may judge that this is a digression, having no connection with *Medical* Topography.

Respectfully submitted,

P. WROTH, M.D.

HISTORY

OF THE

EPIDEMIC OF YELLOW FEVER

IN

CHARLESTON, S. C., IN 1854.

HISTORY OF THE EPIDEMIC OF YELLOW FEVER IN CHARLESTON, S. C., IN 1854.

THE summer of 1854 will long be remembered, in Charleston, for the intensity and protraction of its heat. The winter and spring had been generally mild; but the cool weather continued to the early part of June, when the warm weather exploded. The heat which ensued was greater than that of any year since 1804, the thermometer marking as the extreme 95° on the 9th of July. Hot as the weather was thermometrically, it was still hotter sensationally, even the breeze being hot, parching, unrefreshing by reason of its prevalence chiefly from the land side. The systems of all exposed to the influence of weather of such character were, consequently, relaxed, enervated in a great degree, and several cases of *coup-de-soleil* occurred.

The quantity of rain which fell in May, was 5.29 inches; in June, 4.18; in July, 6.62; in August, 1.56; and in September, 8.73 inches.

The register thermometer marked for

	Day mean.	Night mean.
May	79.80	64.50
June	84.63	70.90
July	88.74	73.96
August	89.12	75.16
September	85.23	71.83
October	76.61	58.67

The mean dew-point in May, was 68.67; June, 72.50; July, 76.70; August, 77.29; September, 73.83.

It will be seen by the above brief statement of the meteorological conditions which existed in the summer, that there was a proclivity to the forms of malarial fever; but so far from the fact of cases of these fevers having been either numerous or violent, only a few mild cases of both were reported at a meeting of the Medical

Society of this city, to have been observed in June and July. The origin of periodical fevers, I may remark by the way, is very uncommon in Charleston; it is only in the suburbs, on the very outskirts, that they occur. When they have been observed in the city, they have usually heralded the approach of, or accompanied yellow fever.

The streets and sewers had been kept as clean as usual, and no excavations or upturnings of the soil had been made since April; but a number of lots, particularly in the western part of the city, had been in process of reclamation during the last two or three years, the filling being made with sawdust and other fermentable materials, with no superstratum of sand, or other earthy matter, to prevent the truly offensive emanations arising from their decomposition. Such were the conditions meteorological and telluric, which existed at the time the yellow fever made its appearance.

I will now proceed to give the dates and order of succession of the cases of the disease, until they became too numerous and scattered to offer interest in any point of view whatsoever.

On the 11th of May the steamship Isabel arrived from Havana and Key West, at both which places yellow fever was prevailing. Three days after her arrival, a steerage passenger who had been taken in at Key West was admitted into the Marine Hospital under my care, with well-marked yellow fever. He threw up black vomit during four days consecutively, but recovered.

On the 11th of July, the Isabel again arrived from the same ports. One of her passengers, an Irish nurse, went to a hotel, complaining that she felt badly from the effects of sea-sickness. The following afternoon she attempted to leave in one of the New York steamships, but was prevented from doing so by her extreme illness. Her case having by that time assumed the features of yellow fever, she was sent to the Lazaretto that night, when and where she died, throwing up black vomit freely.

The British barque Aquatic sailed, on the 25th of June, from Matanzas, Cuba, for Cork, Ireland, with a cargo of molasses. On the 3d of July one, and on the 4th another, of the crew died of fever; on the 4th two more men were attacked; about this time the vessel sprang a leak, and the remainder of the crew being more or less disabled, the captain was forced to run her ashore near Georgetown, S. C.; here she was relieved of a portion of her cargo, and as much water pumped out of her as was necessary to prevent her from sinking. She was then towed to quarantine ground, Charleston harbor, with her hold in a very foul state; the crew, although

ot sick, were sent to the Lazaretto, and she was allowed to come o to North Commercial Wharf on the 13th of July. She remained here two days and then went up to Dry Dock Wharf, where she as finally pumped out and disinfected.

The Spanish polacres, Concha and Columbus, arrived on the 21st f July, the former at Central Wharves, the latter at Accommoda-on Wharf, after an 8 days' passage from Havana. Two days after he Columbus left Havana, one of the crew died of yellow fever; ut at the time of arrival in Charleston the crews of both vessels ere well. Four days after their arrival, a seaman was attacked n the Columbus, and sent to the Lazaretto, where he died of yellow ever. She was then ordered to Quarantine, where she was disin-ected. Several cases, called by the attending physician *catarrhal*, ccurred on the 25th of July, on the Concha, one of which appear-ng to the port physician to be rather suspicious, was sent to the azaretto, where he recovered, as did the others.

That the cases so far reported were imported will hardly be lenied.

The ship Sullivan, from New York, arrived the 21st of July (the ame day on which the Concha and Columbus arrived) and went nto the same dock with the Columbus, but at Central Wharves. On the 4th of August one of her crew was attacked and was ad-mitted into the Marine Hospital on the 7th, with well-marked yel-low fever; on the 9th he was transferred, together with another from the same ship who was seized on the 7th, to the Lazaretto. The former died on the 10th with black vomit; the latter recovered.

The barque Vesta, from Boston, arrived July the 16th at Dry Dock wharf, and lay next south of the Aquatic, in the same dock. On the 7th of August one of the crew was attacked with yellow fever, and was sent into the Marine Hospital, whence he was taken on the 9th, with the two from the Sullivan to the Lazaretto. On the 9th another was attacked, was admitted into the hospital on the 11th, and died with black vomit on the 15th.

On the 7th of August, Mr. S., a native of Barcelona, Spain, clerk to Hall & Co., consignees of the Spanish polacres, Concha and Co-lumbus, was attacked at his residence, the Planters' Hotel, Queen Street, with yellow fever and recovered. Mr. S. had been several times on board the Concha, had taken several meals there, and even indulged in a *siesta*.

The brig Iris, from Rockland, Maine, arrived on the 22d of July at Custom House Wharf. August the 1st she hauled round to

Potter's Mill in the Ashley River, about one mile westward of the city. On the 10th of August, the captain, after having been several days sick, was admitted into the Marine Hospital, with yellow fever: he was extremely ill, but finally recovered.

Mr. Garvey, residing at No. 20 Pinckney Street, a stevedore, was employed in pumping out and disinfecting the barque Aquatic, during the greater part of which time he worked in the hold. While heated by work he was wet by rain and was attacked on the 11th. A physician was called to see him on the 13th, and he died on the 15th, of coma. About the same time, Mr. McNeall, an Irishman employed with Mr. Garvey in the hold of the Aquatic, likewise sickened with yellow fever, but recovered. Of fifteen men employed on the *deck* of that vessel *two* died. (Dr. W. Hume, *Charleston Medical Journal and Review*, vol. x. No. 1.)

The barque Aura, from New Orleans, arrived August the 3d, at Brown's Wharf. On the 10th the captain was seized by yellow fever: on the 12th she went to Potter's Mill, Ashley River. On the 13th one of the seamen was attacked; he was admitted into the Marine Hospital on the 14th, and recovered.

An Irishwoman in the service of Mr. G. M., East Bay Street, opposite to North Commercial Wharf (where the barque Aquatic lay during two days), was attacked on the 12th of August, and died on the 16th with black vomit.

Mrs. Gorham, an Irishwoman, residing at No. —, Calhoun Street, was attacked on the 15th, and died with black vomit on the 18th. Her daughter, two years of age, was attacked on the 17th, and died with black vomit on the 20th.

Mr. F., from Columbia, S. C., a clerk to Mr. D., whose office is on North Central Wharf, near the berth of the Concha, which vessel he visited, as did Mr. S., above mentioned, was attacked on the 17th August, and died at his place of residence, the Victoria Hotel, King Street, on the 27th, with black vomit.

The schooner Monterey, from Philadelphia, arrived at Central Wharves on the 7th August. On the 15th, one of the crew was seized with the fever, and entered the Marine Hospital on the 17th. He recovered.

The schooner Susan Cannon, from Baltimore, arrived at Central Wharves on the 7th August. On the 17th, one seaman was admitted into the Marine Hospital, and died with black vomit by stool, on the 22d.

The schooner J. P. Brown, from Philadelphia, arrived at Central

Wharves, on the 8th August. On the 15th, she went to Potter's Mill, Ashley River, to load with lumber. On the 17th, one of the crew was admitted into the Marine Hospital, and died on the 19th with black vomit.

The schooner Maryland, from Baltimore, arrived at Central Wharves, on the 9th August. On the 17th, the captain entered the Marine Hospital, and died of coma on the 21st.

The brig Emily, from New York, arrived at Accommodation Wharf, August 8th. On the 15th, a seaman was attacked, entered the Marine Hospital on the 18th, and died on the 20th, with black vomit.

The schooner Henry Nutt, from Philadelphia, arrived at Central Wharves, August 9th, and lay there until the 16th, when she hauled to Boyce & Co.'s wharf, which is the eighth wharf below Central. On the 17th, the captain sickened with yellow fever and recovered. On 21st, one of the crew was attacked, was sent to the Marine Hospital on the 22d, and recovered.

A painter, residing at 33 Broad Street, was attacked on the 18th August, and died a few days after.

On the 19th, two Germans, residing at the foot of Hasell Street, were seized and died, the one on the 22d, the other on the 23d.

The schooner Yorktown, from Baltimore, arrived at Central Wharves on the 10th August, where she lay until the 19th, when she went into the Ashley River to take in a load of lumber. On the 21st, the captain was seized with yellow fever, and recovered.

The schooner Maine Law, from Philadelphia, arrived at Central Wharves, 9th August. She lay there four days, and went into the Ashley River. On the 21st, two seamen, natives of Azores, were attacked, and admitted into the Marine Hospital. Both died on the 25th, with black vomit. On the 22d, two other seamen were attacked, and died on the 27th, with black vomit. Two more—making six in all, the whole crew—died subsequently.

The Spanish barque Mallorquin, from Porto Rico, arrived at Central Wharves on the —— August. The captain was attacked on the 22d, and died on the 24th, with black vomit. Two of her crew, attacked about the same time, were sent to the Marine Hospital, and recovered.

It is unnecessary to extend further the account of the earlier cases of the disease, since its spread among the unacclimated foreign population, chiefly the Irish and Germans, was very rapid.

Instead of first attacking, and being limited for a time to, its old range, viz: that portion of the city bounded by Tradd Street on the south, Wentworth on the north, King on the west, and the harbor on the east, it seized and bore severely on those parts, such as Calhoun and Franklin Streets, which were low and damp (the latter recently reclaimed), and crowded with the laboring foreign population just mentioned. In the course of a month, it overleaped even the extreme limits of its former prevalence, and invaded all parts of the city, its geographical distribution being more extensive than ever before known. From Line-Street to South Bay, from the Cooper to the Ashley River, low spots and high sand-ridges, where water nearly free from brackish taste is found, all suffered alike; no portion, whatever its terrene condition, escaping its visitation. Nor sex, nor race, nor condition, nor age, enjoyed an exemption from it; in short, so universal was its diffusion, so great the number attacked, as nearly to entitle it to the appellation of "Pandemic."

During the month of August, and the first half of that of September, the disease confined its attacks almost exclusively to the foreign population, both Europeans and the people of the United States, the native population resisting it. But, after this time, they yielded to its influence, first children, both white and black, then adolescents, and finally adults up to middle age.

On the 8th of September, a violent storm occurred, which lasted three days, by which, there being a coincidence of northeasterly wind, full moon, and abundant rain, all the low parts of the city were submerged. Its effect in causing an aggravation of the cases then under treatment, and an increase of new cases, by reason of the wetting to which many were subjected, was immediately manifest; the number of deaths reported for the week following the storm amounting to 129, the greatest number that took place in any one week. So that the epidemic may be said to have reached its culminating point at this time, its decline subsequently being quite apparent. Now, it is extremely probable, that although the *immediate* effect of the storm was that which has been stated, yet, that by washing the impurities from the surface, cleansing the sewers, ventilating the narrow lots, courts, lanes, cellars, &c. &c., and changing the meteorological state, it was ultimately beneficial, may be inferred from inspection of the table of the weekly mortality, introduced elsewhere. During the month of October, the decrease of cases and of weekly deaths was rapid; and the cessa-

tion of the disease in what is called the "epidemic" form, may be dated from the end of this month.

The *general features* of the fever did not differ from those it has presented in former epidemics; the hemorrhagic character which has marked the disease of late as prevailing here, being conspicuous in this instance.

Passing over the symptoms as not deviating in a notable manner from those of other epidemics, I come, in the next place, to the mortality.

By reason of the general prevalence of cholera in the Northern and Eastern States, there was a smaller amount than usual of travel among our population: persons who had been in the habit of absenting themselves every summer, remained at home; so that a larger number, relatively and absolutely, were exposed to the influence of the disease than in former epidemics. Notwithstanding this circumstance, our community was not panic-stricken; the banks continued their functions; the shops were kept open; the streets were daily thronged; in short, business went on as usual, and signs of life were everywhere visible. The number of *cases* of the disease has been estimated by a physician, whose sources of information were ample, at between 20,000 and 25,000 out of a population of about 50,000—say 1 in nearly 2 of the population. And yet the mortality was comparatively *very small;* smaller than is exhibited by the records of any other epidemic disease except the Dengue (by some called break-bone fever) of 1828 and 1850, the number of deaths being 627, or *about three per cent.* The subjoined table shows the weekly mortality during the course of the epidemic:—

For the week ending	Aug. 19,	there were	4	deaths.
"	" 26,	"	20	"
"	Sept. 2,	"	26	"
"	" 9,	"	75	"
"	" 16,	"	127	"
"	" 23,	"	118	"
"	" 30,	"	73	"
"	Oct. 7,	"	54	"
"	" 14,	"	49	"
"	" 21,	"	32	"
"	" 28,	"	24	"
"	Nov. 4,	"	9	"
"	" 11,	"	6	"
"	" 18,	"	3	"
"	" 25,	"	5	"
		Total,	627	"

Natives of Ireland	. . . . .	256
" Germany	. . . . .	131
" remainder of Europe, and West Indies	. . .	78
" United States (generally)	. . . . .	81
" State of South Carolina	. . . . .	33
" Charleston	. . . . .	48

Of these, 612 were whites, and 15 blacks and colored. Of the 48 natives of the city, 43 were whites and 5 blacks; the latter were all children. Of the whites 37[1] were children and 6 adults. Of the white native adults, 2 were between 20 and 30 years of age; 2 between 30 and 40; 1 between 40 and 50, and 1 of the age of 84. The last mentioned resided in the central part of the city, and had never been without its limits in her life. She died with abundant black vomit. Another native white female, not included in the above list, died at the age of 75, likewise with black vomit, as I am informed by a physician who attended her. Of the 15 blacks, 5 were native children, and 10 were adults, natives of other States. No native adult black died of the fever.

The disproportion of the mortality in hospital, to that in private practice is striking, and is to be ascribed to the difference in the *class* of patients, the period of the disease at which they respectively come under treatment, the difference of degree of acclimation, mental and other depressing influences, &c. &c. In the Marine Hospital there were 149 admissions, and 51 deaths; in the Almshouse Hospital, 114 admissions, and 51 deaths; in the Roper Hospital 254 admissions, and 92 deaths; making the average mortality in hospital practice 29 per cent. Whilst the mortality in private practice could not have been the ½ of 1 per cent.

The greater proportionate mortality in low and damp situations, was noticed throughout the prevalence of the epidemic. This may, in part, be due to the influence of the hygrometric condition to which those who inhabit such spots are subjected, and to the want of proper ventilation, whereby the poison is concentrated and rendered more efficient; but, in the conclusion to be deduced from the above mentioned fact, the mode of life, the greater liability, by reason of tribal peculiarity, of the occupants, the *degree* of acclimation, &c. &c., must receive full consideration. Inasmuch as I shall have more to say on this topic in the sequel, I dismiss it for the present.

[1] A larger number than in any other year except 1817, when the deaths of children amounted to 48.

Exceptions to the preservative power of acclimation established by either nativity, a previous attack or long residence, or by two or all three combined, were more numerous in this than in any former year, because it was the most *searching* epidemic that has ever prevailed in Charleston; yet the *relative* immunity was maintained. The protective influence exerted by peculiarity of race and tribe was observed in this as it has been in all other epidemics. Although *positively* a larger number of blacks, both native and non-native, were attacked than in any antecedent epidemic, yet *not comparatively* so to the number of whites, native and non-native, who were attacked. The native blacks who fell victims to the fever were all children; *not one adult black having been known to die of it.* The 10 adult blacks who died were natives of other States. I saw six native adult blacks, in my practice, attacked by the fever, two of them severely; but all recovered. Other physicians report a few cases of the same kind.

The admixture of the blood of the Caucasian with this race, increases the liability to attack and to death, both being in direct ratio with the amount of the former.

White children of all ages were attacked; from three or four months up to 15 and 20 years. In some instances all the children (*i. e.* all under 20 years) of a family were seized; thus, in one native family all the children, seven in number, were sick in different degrees. *Native* children of *foreign* parents, appeared to be more liable than those of *native* parents. This is notaby exemplified in the descendants of the Irish branch of the Celtic tribe, such a degree of exemption as is enjoyed by native children of our indigenous population, being rarely established before the 2d and even the 3d generation. We may, however, possibly err in ascribing to tribal peculiarity, what may in part be due to the irregular habits, and neglect of hygienic laws, generally, which characterize the mode of living of this class of persons.

Several native children who had the disease in 1849 or 1852, had it again this year; a few of the number severely.

Many foreigners (adults) who had suffered an attack of the disease in a former epidemic were attacked again; and in a few cases, recently arrived strangers had it twice during this season. Dr. W. T. Wragg, in a very interesting report to the Trustees of the Roper Hospital on closing, at the cessation of the epidemic, that Institution, of which he was the Medical Officer, says, that several of the patients there treated by him, were identified as having had it in

1852, and two positively asserted that they had it twice before. (*Charleston Medical Journal and Review*, vol. x., No. 1.) But as this question bears some relation to one which will engage us further on, I shall recur to it in that connection.

Age, independently of any other circumstance, seemed to exert, in a marked manner, a protective agency, very few persons, either white or black, native or foreign, acclimated or non-acclimated, being attacked after the climacteric period of life, say after 45 or 50 years of age.

The fatality of the disease was, in general, in direct ratio with the insidiousness of its invasion. I have seen patients, both old and young, but chiefly the latter, who would present symptoms indicative of nothing more than *malaise*, upon which, after they had lasted an uncertain time, collapse would abruptly supervene, followed by death. On the other hand, when the onset was violent, when, in other words, the disease exploded, its force was soon expended, its duration being, as the rule, short, and the termination favorable.

The proportion of recoveries after black vomit was greater than at any former prevalence of the fever. This terrible symptom is no longer considered as almost certainly indicative of a fatal issue, the proportion of recoveries after it having steadily increased in each succeeding epidemic since that of 1835. This year (1854), in the Roper Hospital, of 74 who had it, 9 recovered. Such recoveries were more frequent in private than in hospital practice, in children than in adults, and according to the period of the disease at which it was thrown up; the earlier the greater the prospect of recovery. Many native children threw it up within the first 24 and 48 hours, and recovered. In this connection may be considered the question: To what is due the greater mortality attending the ejection from the stomach of the substance called "black vomit" than that attending the passage of the same fluid by stool, notwithstanding that a much greater quantity of blood may be lost by the latter than by the former outlet? To this question, I confess that I am unable to give a satisfactory answer. There can be no doubt that in a great many, if not in all the cases in which this altered blood is passed through the bowels, it is poured into the stomach, as well as into the intestinal tube, numerous autopsies having revealed its presence in the former, as well as in the latter viscus, where no vomiting had occurred. I would suggest, in explanation of this phenomenon, the probability that the *act of vomiting* (involving nervous

prostration at a time, generally the latter stage of the disease, when the patient is illy able to bear it) is the cause, were it not, in the first place, for the fact that, in some cases, the individual vomits but once or twice before he dies; and, in the second, for the circumstance that, in most cases, black vomit is thrown up by *apparently* a spasmodic contraction of the stomach, diaphragm, &c., and without much, if any, general muscular effort and nausea; retching being rarely observed to accompany it.

Of the *nature* or composition of black vomit, concerning which so much has been written, I have nothing, derived from my own investigations, to report. I avail myself, however, of the statement of the results of microscopic examinations of this fluid made by Dr. F. T. Miles, in conjunction with Dr. J. T. Porcher, furnished to Dr. J. J. Chisolm by the former gentleman, and embodied in his able report on the epidemic in the *Charleston Medical Journal and Review*, vol. x., No. 4.

"1st. The acidity of the fluid vomited in yellow fever is always marked, and, as I am disposed to think, varies in intensity with the gravity of the case. The bluish-white fluid (sometimes called *white vomit*) occasionally vomited in the early part of the last stage of the disease, only wants the admixture of blood to resemble perfectly in its constituents the black vomit, which it usually precedes. The bluish tint strongly reminds me of that described by Beaumont, as produced by the admixture of saliva and gastric juice. The determination of the particular acid which gives the reaction to the fluids presents great difficulty. We were disposed to doubt the presence of free hydrochloric acid, as we distilled over with the water-bath two-thirds in bulk of the fluid without finding a trace of acid in the fluid in the receiver.

"2d. Although I think we must unhesitatingly attribute the coloration of the vomit to the hæmatin of the blood, acted on by the acid fluid, nevertheless, in the majority of specimens examined, embracing those most deeply colored, *blood corpuscles were but rarely found among the solid particles which abound in the fluids.* These corpuscles, when examined either singly or grouped in small masses, appeared very pale, as if deprived of their coloring matter, having a perfectly smooth, regular outline, and no appearance of corrugation. In exceptional cases, in which blood corpuscles are found predominating, they still retain their normal outline.

"3d. In every specimen of the vomit examined, when a portion of the characteristic "coffee-grounds sediment" was placed under

the microscope, it was seen to consist of a striated mucus entangling a very great number of highly refracting particles, with outlines varying more or less from the circular. These particles, the constant presence and very great number of which attracted our special attention, we came decidedly to the conclusion, were the slightly altered nuclei of ruptured cells, some of which were, doubtless, yielded by the squamous epithelium and common mucous globule. But we convinced ourselves, by repeated and careful observation, that the vast majority were derived from the *oval granular cells, which fill the stomach tubes, the Peptic or Rennet cells of Kölliker.* The complete peptic cells were not unfrequently observed once or twice, several together, exhibiting a cast of tube from which they had been expelled.

"4th. The minute structure of the stomach appeared to have undergone *no* alteration, the superficial cylindrical epithelia presenting their normal appearances and position. Only once or twice, in the course of our observations, did we see a cylindrical epithelium in the field of the microscope. The stomach tubes were packed with peptic cells, as I have always seen them in the stomachs of animals killed during digestion, and once saw in the stomach of a criminal, who had taken food a short time previous to his execution. A strongly marked congestion of the capillaries was seen in parts of the stomach, but this was far from being universal."

Prominent among the *exciting* causes of the disease were a wetting by rain and sleeping in the open air, either under an awning, or without any covering overhead. Almost all who were seized on shipboard stated, that on account of the heat and the mosquitoes in the cabin, they slept on the decks of their respective vessels, some under an awning, others without covering. There can be no doubt that the disturbance of the equilibrium of the functions induced by the check thus given to the cutaneous transpiration is an immediate cause of the attack of the disease. The *materies morbi*, in this as in other zymotic diseases, may be received into the system; but, its removal in a state of functional activity of all the excretory organs going on, *pari passu*, with its introduction, it would, perhaps, in many instances, not accumulate in sufficient quantity to produce an attack of the fever. But the function of one of the great emunctories for effete matters being suspended, the specific poison acts upon the fermentable substances thus re-

tained, and fermentation or zymosis is established, and the disease developed.

The shortest time of exposure to the poison of yellow fever, followed by the effect, was *somewhat less than two hours.* A negro from one of the neighboring islands visited the city, during the course of the epidemic, did not remain quite two hours, returned and died of the fever with black vomit, a few days after. Dr. Frost (*Charleston Medical Journal and Review*, Vol. x., No. 1) refers to a case which occurred in Mobile, Alabama, in which the time of the exposure was nearly as short. A countryman drove his cart into Mobile, stayed two hours, returned to his home, took the fever, and died. Cases in which exposure of one and two days sufficed to produce the fever, were not uncommon in Charleston.

The time intervening between midnight and 6 A.M., was the period of the 24 hours at which the disease, generally, invaded. This fact was accurately ascertained in a great number of cases.

With a view to its *prophylactic* effect, the sulph. quinine was made extensive trial of, and utterly failed so far as my own observation, confirmed by that of others, went, in averting the fever; at least, as far as may be inferred from the number who were seized by the fever, notwithstanding they took this alkaloid. This therapeutic fact furnishes a strong argument in opposition to the doctrine of unity of cause, and consequently of nature of periodical and yellow fevers.

Yellow fever forms no exception to the general rule, that in all diseases the pathology of which is obscure, the treatment will be infinitely varied; the therapeutics of each practitioner being founded upon the opinion which he holds in reference to its nature. The inflammatory, or quasi-inflammatory state, which the ever presented in times past, having been substituted by the hemorrhagic and more decidedly adynamic conditions, the change has given rise to a modification of treatment, in one respect. Abstraction of blood, both local and general, has been abandoned as extremely prejudicial, and corroborants and stimulants are employed more freely. It may be said, indeed, that the profession of the city has, generally, settled down upon the opinion long since promulged by Pitcairn, respecting common continued fever (typhus and typhoid), viz: that yellow fever cannot be *cured*, but *may* be *conducted* to a favorable termination.

The plan of treatment generally pursued, was to evacuate the bowels at as early a stage of the disease as possible, by means of a

mild cathartic, say calomel, or calomel and rhubarb, followed by Epsom salts or castor oil, care being taken to avoid ptyalism, for the reason that this condition, when induced accidentally by some, or designedly by others, seemed to be decidedly hurtful. Dr. Chisolm, in the report above referred to, states that three persons, members of the same family, who were salivated, had profuse hemorrhage from the mucous surfaces which, despite of all remedial measures, caused death. A case was admitted into the Marine Hospital, under my care, so profusely salivated by the master of the vessel to which he was attached, that his tongue protruded considerably from his mouth, rendering deglutition of both fluids and solids impossible, and even impeding respiration. This patient died in about five days after his admission, exhausted by the copious hemorrhage from the buccal cavity, and inanition combined.

Neutral mixtures were prescribed to act upon the skin and kidneys; blisters to relieve gastric irritation; opium in some form to allay jactitation and induce sleep; ice in pellets, and, when tolerated, ice water *ad libitum* was allowed. The wet sheet or packing plan was employed in some cases, but without satisfactory results.

For my own part, having been for many years impressed with the necessity of early support being afforded the vital powers in all forms of continued idiopathic fever, until, and to the end that the crisis be passed, in this epidemic, I placed my reliance, in regard to obviating the tendency to death, and thus conducting the disease to a favorable issue, upon aliments, as soon as they were tolerated by the stomach, and stimulants. Of the former, beef tea (essence of beef), chicken and veal broths, and milk, were given at stated intervals, and in quantities regulated by the state of the system, the tendency to irritation of stomach, &c. The latter were employed on the principle laid down by Dr. R. B. Todd, in his mode of treatment of the continued fever of Great Britain, viz., in such doses, and at such intervals, as would keep up the *stimulant* without allowing the secondary or *depressing* effect to occur. With this purpose, I ordered, according to circumstances, one or two tablespoonsful of brandy, to be given every hour or two hours, combined or not with milk. One patient, whose case was marked by such excessive gastric irritation that everything of a medicinal character, even when put upon the tongue, as calomel, increased the vomiting, would, I verily believe, have died, if I had persisted in attempts to introduce medicinal substances into the system. Seeing him cold and clammy, and rapidly failing, I ordered a discontinuance of all

medicine, and beef-tea and brandy to be given. He retained the first dose of these substances, and, on its being repeated several times, he became warmer, and stronger; the gastric irritation did not return, and he rapidly recovered.

Convalescence, usually prompt and rapid in this fever, was generally tedious and protracted. It extended, in some cases, to six months; the systems of the patients being left dilapidated in a remarkable degree. The rawness produced by vesication—it mattered not by what means, by cantharides, aqua ammonia, or a mineral acid—was long in healing, and the part not unfrequently sloughed, demonstrating the loss of plasticity which the blood had undergone.

The view which refers the seat of the fever to the great sympathetic nerve, or the nerve of organic life, seems to me to be erroneous. That the sympathetic system is involved, and even prominently, in the morbid action, appears to be indisputable; but that the first impression of the specific poison is upon the blood, constituting the first link in the chain of phenomena of the disease, is inferable from a variety of circumstances. The scope of this report not admitting of a lengthy consideration of them, I shall content myself with mentioning a few.

1. The analogy of character which the yellow fever presents to diseases (such as variola, scarlatina, &c.), arising from a specific poison of animal nature, in attacking, as the rule, but once, and in the impossibility of arresting it, or cutting it short (which I think proved beyond a reasonable doubt), is a strong argument in favor of the poison of this fever acting (like those of the eruptive class) first upon the blood.

2. If it be proved (which is not the case) that common continued idiopathic fever (typhus and typhoid) has its seat (or have their seats) in the sympathetic system, it would show that this nerve is not the *peculiar* seat of yellow fever, but that it is the seat common to them all.

3. An attentive consideration of the phenomena of idiopathic fever in general, of every variety, will show that the secretions are notably affected, some being perverted, and others checked. This derangement of the secretory and excretory processes is as well marked, though in minor degree, in intermittent and bilious remittent as it is in typhus, typhoid, and yellow fevers, which proves the implication of the sympathetic nerve in the former as well as in the latter. In typhus and bilious remittent fever, the deterioration of the blood is sometimes quite manifest, being denoted in the former by

subcutaneous hemorrhage, and, in the latter, by the occasional ejection from the stomach of a black fluid resembling the black vomit of yellow fever. There are very few, at the present day, who are disposed to deny that even intermittent fever is a blood disease, inasmuch as catalytic and hæmatic medicines are frequently required for the removal or neutralization of the poison, and the restoration of this fluid to a healthy state.

4. And lastly. It seems that, if that theory be correct, it is necessary to admit the partial dependence, at least, of the blood for its vitality and integrity upon the sympathetic nerve; since, if, as that doctrine maintains, the primary impression of the specific poison be made upon this nerve, the intoxication of the blood, and the derangement of secretion and excretion, result from the impression conveyed to the different organs. These facts and arguments, among many others that might be adduced in support of the negative of the subject, lead to the conclusion that the blood is primarily the recipient of the poison; that the fermentation, or zymosis, thus set up, eventuates in all degrees of disorder, from simple change, absolutely or relatively, of one or more of its constituents, up to death of the whole fluid; that in proportion to the *degree* of inquination, will be the ravages created in the system; that the organic processes, nutrition and secretion, become perverted or suspended; that the nervous system, that of organic as well as animal life, receives its quota of injury; and lastly, that the blood thus altered in constitution becomes a foreign body, which must find an exit from the system through the various channels provided by nature for the escape of noxious matters, which emunctories are the liver, stomach, and bowels (indeed, the mucous membrane wherever it exists), skin, kidneys, &c. Secretion and excretion, and nutrition, are no more disordered in yellow than in typhus and typhoid fevers; nor more than in intermittent and remittent, *in proportion* to the *degree* of disorder produced by the poison (malaria) upon the blood; that of the former, which is probably of animal nature, being greater than that of the latter, which is of vegetable origin.

In the case of all diseases resulting from a specific poison, especially that of animal nature, the difference of effect depends upon the difference in the *nature* of the poison. In this way may be explained the circumstance that, in the class of eruptive fevers, the prominent phenomena manifest themselves in the skin and mucous membrane, whilst those of the idiopathic fevers, continued and periodical, in the derangement of the constitution of the blood

Thus, likewise, may be explained the minute shades of difference, in their phenomena, exhibited by typhus, typhoid, and relapsing fevers. The *law* governing the action of poisons seems to be that one poison shall act in one way, and another in another and more or less different way, the operation of no two, whether animal or vegetable, being exactly alike.

As in other epidemics, it was a difficult matter to decide how many types of fever prevailed simultaneously with the yellow fever. This is a question pregnant with interest, but inasmuch as its consideration would involve a long discussion of theories (such as the identity or non-identity of yellow and bilious remittent fevers, their mutual convertibility, &c.), which, in the present state of the science, would be unprofitable, I shall merely state that opinion was divided on the subject, some maintaining that typhus and typhoid, bilious remittent and intermittent, prevailed at the same time with yellow fever, whilst others recognized the fever as one and the same disease. It is possible that, in the present instance, both parties are right as far as their observation, respectively, went; for cases of bilious remittent, intermittent, and typhus, were not very numerous, certainly not so numerous as to entitle them to be called epidemic, and so may not have fallen under the notice of those professing the latter opinion; and when typhus occurred, it was, in the majority of cases, consequential of yellow fever.

Cases were not uncommon in which, after the patient had passed through an attack of bilious remittent or intermittent, he contracted yellow fever, and *vice versa*, several days intervening to remove all doubt of the fact. Again, cases occurred in which the blending or intermixture of type was well marked, the periodical element requiring quinia for its relief. But, as the rule, there was but *one* fever prominent, and absorbing all others; the fact having been, from time immemorial, observed of the individuality of the original type being lost or masked by being merged into (rather, blended with) the more grave malady.

In this connection may with propriety be considered the subjects of the significance, in etiological and prophylactic points of view, to be attached to what is called "ephemeral" fever, and of second attacks of yellow fever. That *all* fevers, not distinctly referable, on the one hand, to the periodical (intermittent and remittent), and, on the other, to typhus and typhoid, which prevail at the same time with yellow fever, are to be classed with it, to be considered as part and parcel of it, is subject of reasonable doubt. I have no hesitation

in admitting that the *majority* of cases of "ephemeral" fever—a form of fever presenting the mild features of yellow fever—are really of that nature, for there are mild cases of yellow fever as of any other disease. But there is a certain proportion of cases in which, after the patient has had one attack, say of a day's duration, he recovers, and in a longer or shorter time is again attacked; it may be in the same degree of mildness, or it may be that the fever, being more severe, and continuing beyond 24 hours, is developed into unmistakable yellow fever. The difficulty in deciding the question as to the nature of the first fever resides in the circumstance that the differential diagnosis in the first 12 or 24 hours of yellow fever, bilious remittent, intermittent, and symptomatic fever from transient cause of irritation, is frequently doubtful, by reason of identity of symptoms. In the circle of my practice, I saw several patients who had the mild and short attack first, and were afterwards attacked severely with well-marked yellow fever; others, fewer in number, had two attacks of the mild fever, and then the violent form. I saw a family, consisting of mother, daughter, and two sons, non-natives of the city, but several years resident in it; the mother had *one* attack, the daughter *two*, one son *two*, and the other son *three* attacks, the last or third attack of the second son proving fatal, with black vomit. Now all of these attacks were violent, but none, except that which terminated fatally in the case of the second son, lasted beyond two days, and did not present a remission, but a gradual decline. In the case of a little boy, the son of a lady who is a native, but who himself was not born in the city, who took, during his father's illness with yellow fever, a violent form of fever, the fever passed off in 24 hours, and two days afterwards he felt well enough to play about the house. Hearing the mother express her thankfulness that he had passed through the yellow fever, I warned her against indulging the expectation that he would not be attacked again. In the course of a week, he was again seized with fever, of the nature of which this time no doubt could be entertained. He threw up black vomit in great quantity during four days, but ultimately recovered.

The necessity is thus forced upon us of taking the one horn or the other of the dilemma; we must either admit that a mild attack of yellow fever does not protect the system from another attack, by exhausting the susceptibility to further impression, or that they are cases of aborted intermittent or remittent, or of symptomatic fever from transient cause, such as crudities in the alimentary

anal, exposure to high solar heat, &c. &c. If the first be taken, hen the cases of second attacks of yellow fever are quite numeous; if the second, they are rare. Hence may arise disappointment, and consequently loss of confidence in the protective agency f one attack, from the impossibility, in some cases, of making a orrect diagnosis of the fever. Hence, again, the importance of a guarded assurance of future immunity after an attack of the mild nd ephemeral form of fever, especially in the cases of strangers, or it is chiefly, if not wholly, among them that these attacks are bserved.

Having thus briefly sketched the general features of the epidemic, reserve for consideration, in the last place, the point by far the most important in its history, and which is of paramount issue at he present day, viz., its origin.

One of the most difficult problems in the whole range of medical cience is to determine in a given disease what is the *causa causans*, r *generating* cause, and what the *causa sine qua non*, or that without which the first would be inoperative; in other words, to distinguish etween that which is *essential* and that which is *accessory* to the ausation of disease. It is generally far easier to say what *is not* han what *is* the cause of morbid action. From this obscurity perading the etiology of disease in general, yellow fever is by no neans exempt.

Fully sensible of the difficulties attending such an investigation, shall proceed to examine the validity of some of the prominent lleged causes of yellow fever in reference to their separate or united apability of giving origin to the epidemic of 1854.

And first of terrene conditions:—

The city boasted, as above stated, of an average degree of cleanliness; the offal was removed from the streets with accustomed regularity daily, and there was no stagnant water in them. Mud lots, particularly in the western part of the city along the Ashley River had been reclaimed and filled with sawdust, rice chaff, and other fermentable substances, together with the offal and garbage of the streets. These fermenting and decomposing materials exhaled, as may readily be supposed, the most offensive odors. But it is known to all the residents of the city, that the same process has been going on for many years past, during seasons when the fever *has not* prevailed, as well as when it has.

In 1853, a *healthy* summer, the portion of Rutledge between Broad and Beaufain Streets, being made of animal and vegetable sub-

stances in all stages of decay, gave forth such offensive odors that the inhabitants of the neighborhood were forced to close the doors and windows of their respective houses exposed to them. I have repeatedly seen flocks of turkey-buzzards disputing the animal refuse of the markets deposited in this spot. Now, were the emanations from these putrescent masses capable of themselves of generating yellow fever, it surely would have proceeded from such a hot-bed as this place was. And it is well known that, during the last twenty years, the extension of Broad Street towards the Ashley River, and of Lynch Street to connect with the former, across mud flats, has been steadily going on, under the direction of the city authorities, the filling being made with the contents of the scavengers' carts, notwithstanding the protests and remonstrances of the occupants of the neighboring houses situated to the north, whose olfactories were constantly assailed by the stench proceeding from it. Yet so far from yellow fever *originating* here, *this neighborhood had never even been visited by it before the summer of* 1854.

When treating of the mortality, I stated that the disease attacked at an early period and bore with severity upon two spots in particular; which circumstance seemed to favor the view of the causative agency residing in terrene conditions. To these spots I will now refer. The one is in Calhoun Street, between Elizabeth and Meeting. It is here that a case of yellow fever (case of Mrs. Gorham) occurred on the 15th of August. Now, lest it be inferred that this spot had any agency in originating the disease in this case, I will mention that it has been reclaimed from the salt water for so long a time that the houses first erected upon it are tottering to their fall; and that it was in no worse state hygienically in 1854 than it had been in any previous year when yellow fever did not prevail; moreover that *it has rarely been visited by it.*

Again: by reference to the dates and order of succession of the cases, it will be seen that Mrs. Gorham was attacked eight days after the first seaman was sent to the Marine Hospital from the Sullivan, and at a still later period than those who were sick on board the Columbus.

The other spot, situated westward of Franklin Street, and opposite to the Marine Hospital, has been recently reclaimed and built upon, having a narrow alley leading to it. This is one of the places alluded to in the earlier part of this report, as exhaling, by reason of being filled with offal and garbage, most disagreeable odors. But did the first cases of the fever originate here? No; notwithstand-

ing that it had the very population (recently arrived Irish) most obnoxious to the disease. It was not until two weeks had elapsed after the first cases occurred on ship-board, and not until 15 or 20 patients laboring under the fever had been received into the Marine Hospital, about 50 yards distant, that it made its appearance among the occupants of these houses.

Did I deem it necessary, I could multiply cases of this character, by which the connection between telluric conditions and the origin of yellow fever is disproved. And these observations, as concerns Charleston, are amply corroborated by Drs. M. Dowler and McFarlane, in respect of the behavior of the fever in New Orleans; the disease *never* showing itself *first* in those localities in which heaps of matters in a state of fermentation and decomposition exist, but invariably among or in the neighborhood of the shipping.

But in admitting that the conduct of the fever in Charleston, as regards the number of cases and the mortality, being proportionally greater in low moist spots, than in other parts of the city, of different hygienic conditions (as the sand-ridges), corroborates the "law of cholera" established by Mr. Farr, of Great Britain, as applicable to all zymotic diseases, we must not overlook and forget to estimate at its true value the fact that, by reason of low rents, &c., the class of people, in all cities, who inhabit such spots is precisely that which is the most susceptible of disease in general, and in an especial manner of *epidemic* disease. It is the laboring class, upon whom the curse of poverty—one of fearful magnitude—presses with iron hand; in whom there is utter hopelessness of change of condition for the better; in short, in whom are united and intensified all the influences, moral, mental, and physical, which contribute to make up the sum of human wretchedness and woe—this is the class which, thereby rendered extremely liable to morbific impressions, inhabits such abodes. Mr. Farr has thus erred in ascribing even the propagation or diffusion of cholera and other zymotic diseases, in such places, to telluric and hygrometric states only; he has apprehended the truth, but not the *whole* truth. He has ignored not only the mode of living, habits, &c., of the people, but also the foulness, the inquination of the air which necessarily attends overcrowding. But, in laying stress upon these conditions as active in the *spread* of cholera, he does not imply that its *causa causans* is therein generated.

Examples without number might be cited in which yellow fever has decimated towns and villages situated on high and dry sandy pine-land ridges, in which the soil is so porous as to allow of the

prompt percolation of water. The work issued by the Sanitary Commission of New Orleans, on the epidemic of 1853, alone contains numerous cases of this complexion.

At the commencement of this report, it is stated that there had been no excavation or upturning of the soil, for any purpose whatsoever; an ordinance, prohibiting the disturbance of the earth from the 1st of May to the 1st of October, having been passed by the City Council two years before, and consequently being then of force. There existed at the time of the outbreak of the epidemic, no terrene or other local cause, detectable by the eye either of the profession or the laity, capable of explaining its first appearance at Central Wharves docks. The new Custom House in process of erection, which is situated on the wharf adjoining the Central Wharves on the north, had risen to the height of 15 or 20 feet above ground, and all excavation, piling, &c., had ceased eighteen months previously. But, in order to show in a stronger light the improbability that it exerted an influence in the origin of the fever, I will state that minute inquiry was made relative to the time at which the laborers (chiefly Irish) at this edifice begun to be attacked, and it was ascertained that two weeks had intervened between the first cases which occurred on the ship Sullivan and other vessels, in the above-mentioned docks, and the first among these workingmen; that is to say, after the disease had appeared in different and remote parts of the city. Another circumstance connected with the construction of this edifice is strikingly confirmative of the principle for which I am contending, viz., the want of relation as cause and effect between excavation and upturning of the soil, and the origin of yellow fever. In 1852, when yellow fever prevailed in this city, the excavation and pile-driving for the north wing of this building were going on, 21,000 cubic feet of mud, &c., having been removed, and the concrete laid, by the 5th of August; yet the laborers did not begin to be attacked until some time after the disease had existed in the city, and even then but 15 out of 200 (196 of them being Irishmen) took the disease, five of whom died, according to the pay-roll of the engineer, and the record of deaths in the City Registrar's office. (Dr. Wm. Hume, *Charleston Medical Journal and Review*, Vol. x., No. 1, p. 5.) During the same period of the year 1853, 143,000 cubic feet of earth were excavated, and remained in a heap upon the premises; 200 Irish laborers were employed on it in August and September, and yet not a case of fever occurred among them. (Dr. W. Hume, *ibid.*, Vol. ix., No. 6). The second pit, excavated for a gasometer, was situated on King

Street, near Vanderhorst. It was begun in May and finished in November, 1849, a yellow fever summer; yet the neighborhood was exempt from the disease, the nearest case being that of a German apothecary, residing on King Street, about 200 yards distant, who had been into the infected part of the city. During the summer of 1853, a third gas-pit was dug in Cannon Street. This was a remarkably healthy season; I saw a few cases of bilious remittent in its vicinity, but no cases of yellow fever. Moreover, the deepest and most extensive excavations ever made in Charleston were carried on throughout the summer of 1848, viz., those for the gasometer in Church Street, and for laying the pipes through the whole city; yet a healthier summer has rarely if ever been known.

At the foot of the fish-market, in the dock adjoining the Custom House on the north, lies the recently constructed receptacle for live fish. During the summer of 1853, the digging out of the mud, and the laying with "concrete" went on, but no case of yellow fever occurred among the workmen employed on it, and it was completed in 1854, two months anterior to the outbreak of the epidemic. Up to the 19th of August (the date at which inquiry was made, and two weeks after the fever had appeared among the shipping), none of the operatives had been attacked.

Let us now turn our attention to the alleged connection between meteorological states, and the origin of the yellow fever. The summer of 1854 was, I have stated, excessively hot, the heat being of a parching character—sirocco-like. The breeze, prevailing as it did, almost the whole time from the land, was unrefreshing. But that heat is not the generating cause of the fever, is shown by the following table, for which I am indebted to Dr. J. J. Chisolm (*Charleston Medical Journal and Review*, vol. x., No. 4).

Range of Thermometer in the Shade.

	1849.		1850.		1851.		1852.		1853.		1854.	
	Ext's.	Mean.	Ext's.	Mean.	Ext's.	Mean.	Ext's.	Mean.	Ext's.	Mean.	Ext's.	Mean.
January	72 43	58	74 53	64	69 44	61	67 35	55	69 43	58	73 45	59
February	72 42	58½	69 47	61	75 46	65	74 52	62	69 50	61	71 49	61
March	75 55	65½	76 54	65	75 58	66	76 53	65	74 48	63	80 54	68
April	80 55	70	82 59	68	79 60	70	81 57	67	84 61	71	80 52	69
May	83 64	76	86 69	76	88 65	77	87 62	78	84 68	76	84 60	76
June	90 77	81	88 70	80	89 69	81½	89 72	79	88 74	81	94 62	80
July	90 74	82	93 82	86	94 80	84½	89 79	84	90 79	84	95 78	84
August	91 78	84	92 81	85½	91 74	84	88 73	82	90 76	83	94 78	85
September	87 72	78½	90 71	80	87 63	78	85 71	78	88 67	79	89 68	81

It will be seen by the above table, that the mean temperature of the yellow fever summers, 1849, 1852, and 1854, did not materially differ from that of the healthy summers of 1850, 1851, and 1853; that it was rather higher in the healthy summers of 1850, 1851, and 1853, than in the two yellow fever years of 1849 and 1852; and, in the healthy summer of 1850, the range was higher than in the yellow fever summer of 1854. Besides, it is only necessary to adduce the exemption of many places within the tropics, and of Boston, New York, and Philadelphia (in which cities the thermometer ranges, during the summer months, from 95° to 105°), to prove that heat alone cannot generate the fever.

By reference to the subjoined table, for which I am likewise indebted to Dr. Chisolm, the quantity of rain which fell during the same periods, in inches and quarter inches, will be seen:—

	1849.	1850.	1851.	1852.	1853.	1854.
January . . .	0.1.3¾	1.3.8½	3.1.1	0.0.1½	0.3.3½	3.0.7¾
February . . .	1.1.6¼	1.2.8¼	3	2.0.4	1.3.7¼	3.1.0
March . . .	1.0.2¼	4.3.4	1.1.5	2.0.1¼	3.0.6	0.3.4
April . . .	0.0.2¾	1.2.3	0.3.8	4.2.3	0.0.2¾	1.1.6
May . . .	3.0.7¼	2.2.1	1.2.4	2.2.8½	2.0.0¼	7.0.8½
June . . .	2.0.8¼	0.0.1¾	7.0.2	4.2.6¼	3.2.4¾	2.2.5¼
July . . .	7.3.2¼	0.2.4½	5.2.7	6.3.4	10.2.0¾	7.1.3¼
August . . .	4.3.4	4.2.1¼	4.1.6	3.2.2	5.1.0¾	2.3.1
September . .	6.1.3½	1.2.6¾	0.3.0	11.0.5½	12.3.3¾	9.3.8

Whereas three years of this table exhibit the coincidence of much rain with the prevalence of yellow fever, the two healthy years, 1851 and 1853, show the *want* of that coincidence. Besides, anterior to 1849, excessively wet summers have been healthy; so that the relation of this meteorological state to the origin of the fever is clearly disproved.

With regard to the causative agency of the dew-point, little need be said. It varies very slightly in a series of years, being almost uniformly over 70°.

But if telluric and meteorological states cannot separately produce yellow fever, may not their combined operation generate it? This question must receive a negative answer from the account of those states above given, as relating to Charleston alone, without appealing, for proof of the same character, to the history of numerous places within the torrid and lower part of the temperate zones, where the same conditions are united, without yellow fever being seen. Moreover, the disease has existed where the terrene states

were wanting, even though the meteorological may have been present. (*See* the "Report of the Sanitary Commission of New Orleans, 1853," *passim.*) Of themselves, therefore, either singly or variously combined, they are totally inadequate to *generate* the poison of yellow fever, and the only agency which can reasonably be claimed for them is that of giving efficiency to the specific cause by rendering, in virtue of their peculiar influences, the system susceptible of being impressed by it. They can hold no other relations to the fever than those of antecedents, predisponents—adjuvants simply—of more or less power, their morbid influences being manifested in depression of the vital powers, and in obstruction offered to the proper depuration of the blood of the products of decomposition. Thus, *terrene conditions*, which are generally associated with those of *overcrowding* and *filth*, compel those who are subjected to them to breathe an atmosphere charged with carbonic acid, and laden with putrescent emanations; a *high dew-point* interferes with the pulmonary and cutaneous respirations, whereby the perfect decarbonization of the blood is prevented, and languor of mind and debility of the muscular system is induced by imperfect oxydation of decomposing azotized matters; *heat* relaxes, enervates the system, decreases the number of pulmonary respiratory acts, and thus favors the retention and accumulation of carbonaceous and nitrogenous matters in those who take more of these elements in the form of food than is physiologically required, and finally reduces the capacity of the system to react upon and expel the morbific cause. The morbid matters received into, and retained in the blood in these several ways, render it fermentable; in other words, place it in a condition favorable to be acted on by the specific poison when introduced.

Of these antecedents or adjuvants, heat seems to be by far the most potent; indeed, numerous circumstances lend support to the belief that it is the *only* efficient condition—the *causa sine qua non*—in the production and extension of yellow fever. Examination of the Report of the Sanitary Commission of New Orleans, already referred to, reveals the fact, that in all the localities in which yellow fever prevailed, respecting which information was obtained, *the only condition uniformly present was a high degree of heat;* in respect of all other conditions, they differed widely.

A case of yellow fever, in the person of a seaman who came from Key West (where the fever was prevailing at the time), in the steamship Isabel, on the 11th of May, was treated by me in the

Marine Hospital. The patient threw up black vomit freely, during several days consecutively, but recovered. The mean temperature being so low (below 80°) as to excite no fears of its spread, isolation of the sick man was deemed unnecessary. No cases occurred in the ward in which he lay. At a later period of the season (July and August), however, when the mean temperature was above 80°, the introduction of a few cases, and of the impure air of the holds of the vessels from Havana, was sufficient to create the disease; it was like the spark applied to the magazine.

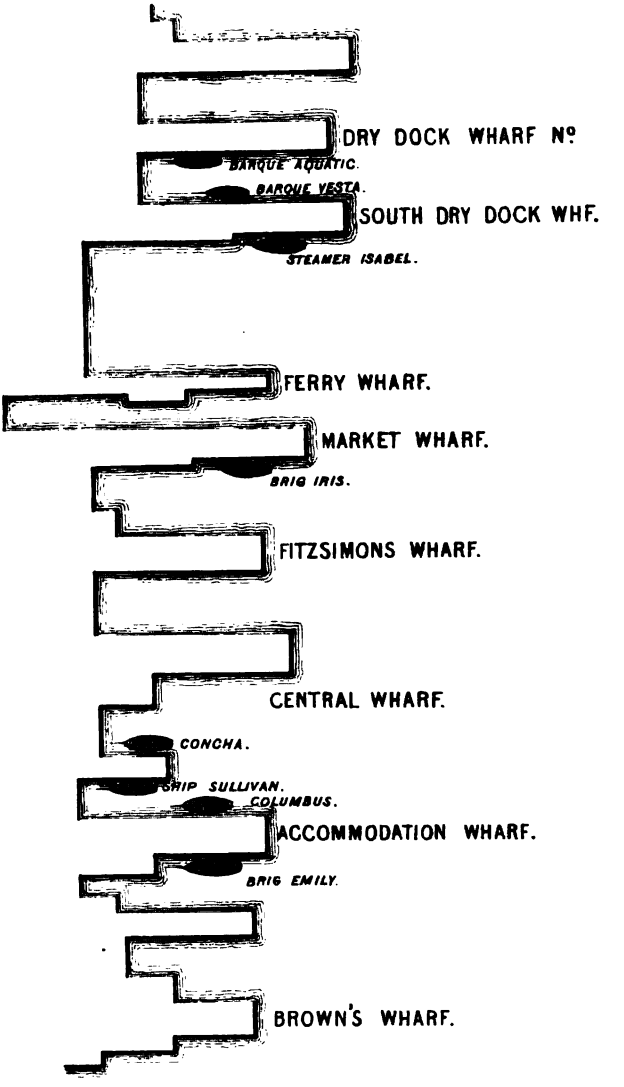
Evidence corroborative of the agency of heat in giving efficiency to the poison, is to be found in the cessation of the fever before frost (which happened in 1854 and in several other seasons), that is, when the temperature is so much lowered that the poison is inoperative. Again, the capacity of accommodation of system to a very high temperature without injury, may enable us to explain, in part, the comparative insusceptibility of yellow fever exhibited by the negro race.

The conditions, terrestrial (including overcrowding, &c.) and meteorological, present in Charleston in 1854, having been found inadequate to account for the *origin* of the fever, but one other possible mode remains to be adopted, and that is, its importation from abroad.

Whatever may be said of the origin of the disease in other parts of the world, it is a striking fact, as regards Charleston, that it is *not until some time after* the arrival of a vessel or vessels from a port or ports where yellow fever is prevailing, generally with a case or cases of the fever on board, that it breaks out in the city. The history of the prevalence of the fever in this city, during the last 150 years, proves that it is only when the intercommunication of Charleston and the West Indies has been considerable, that the disease has shown itself here. At times when—as during the Revolutionary war and that of 1812—intercourse with these islands was suspended, the city enjoyed an exemption from it. No sooner was the embargo act of the last war repealed, and the course of trade with the West Indies resumed, than the fever reappeared. The summer of 1817 was a fatal one. It showed itself again in 1819, 1824, 1827, &c.

That the fever of 1854 was likewise imported, will appear from the following considerations:—

1. In the sketch of the commencement and progress of the epidemic, given in the early part of this report, it has been shown that the first three cases occurred in passengers and a seaman of vessels



HARBOUR

T Sinclair's lith. Phil.ª

directly from the port of Havana, viz., the steamship Isabel, and the Spanish polacre Columbus; and that other cases of very suspicious character occurred on board of the latter vessel and the Concha.

2. That the fourth case occurred in the person of a seaman attached to the ship Sullivan, one of a regular line of packets between New York and this port, which arrived on the same day (July 21) as the Columbus and Concha from Havana, and lay in dock with the former vessel, on board of which one man had died at sea, and another died of yellow fever a few days subsequently to her arrival in port. By reference to the accompanying cut, the relative position of the vessels, while in dock, will be seen.[1]

The Sullivan and Columbus are in the same dock, separated about thirty feet; the former vessel northward of the latter. The Concha lies in the dock next above, but at the same wharf with the Sullivan, the width of the wharf only intervening. Thus was the latter vessel (the Sullivan) placed, so to speak, between two fires. The Spanish vessels remained, the one seven and the other nine days, in close proximity to the Sullivan, and then sailed. On the 4th of August (a reasonable period for the incubation of the disease), one of the crew of the Sullivan was attacked, and came under my care in the Marine Hospital. Two days after, two more of her crew were sent to the hospital.

On the 22d July (the day after the arrival of the Spanish vessels), the brig Iris arrived from Rockland, Maine, and lay in the dock adjoining, above, that in which lay the Concha. (See wood-cut.) After lying there eight days, she hauled, August 1, into the Ashley River, on the western side of the city. On the 6th or 7th August, the captain was seized by yellow fever, and admitted into the Marine Hospital on the 10th.

On the 7th of August, Mr. F. S., clerk to Hall & Co., the consignees of the Concha and Columbus, was attacked by the fever. The office of Messrs. Hall & Co. is on the wharf at which the Concha was moored. Mr. S. not only visited that vessel several times, but even took one or more meals and a *siesta* on board.

On the 7th of August, the schooner Monterey arrived from Philadelphia; on the 8th, the schooner Susan Cannon, from Baltimore; on the 9th, the schooner Maryland, from Baltimore; on the

[1] A mistake has been made by the lithographer in writing "Market Wharf," instead of "Custom House Wharf."

9th, the schooners J. P. Brown and Henry Nutt, from Philadelphia. These vessels lay at Central Wharves, from which the Spanish vessels had recently sailed; and, within ten days after their arrival, one or more men from each of them were sent into the hospital with yellow fever.

The brig Emily, from New York, arrived, August 8th, at Accommodation Wharf, the same at which lay the Columbus; the width only of the wharf separating them. (See wood-cut.) On the 15th, one of her crew was attacked, and entered the hospital on the 18th.

The schooners Yorktown and Maine Law, from Philadelphia, arrived, on the 9th August, at Central Wharves. Two men from the former, and the whole crew of the latter, were admitted into the hospital within ten days after their arrival.

After this plain and impartial statement of facts, can any be found to deny that the disease was introduced into the city from without, and that thence was diffused the poison? This was one of the centres from which it radiated; another remains to be mentioned.

3. The barque Aquatic sailed from Matanzas, Cuba, for Cork, Ireland, on the 25th of June, with a cargo of molasses. On the 3d of July one of the crew, and on the 4th another, was attacked with fever, and died. A few days after, several more men were attacked. About this time, she sprang a leak, and the remainder of the crew being more or less disabled, the captain ran her ashore near Georgetown, S. C. She was then towed into Charleston Harbor; the crew, although not at the time sick, were sent to the lazaretto on Folly Island, and she came up to the city to North Commercial Wharf on the 13th July, with her hold in a very foul condition, containing molasses in a state of fermentation, bilge-water, &c. After lying at this wharf two days, she went up to Dry Dock Wharf, where she was pumped out, and means were taken to disinfect her.

On the 16th of July (the day after the Aquatic went to Dry Dock Wharf, and before she was disinfected), the barque Vesta arrived from Boston, and went into the same dock in which the Aquatic was lying, the distance between them being about thirty feet.

The steamship Isabel arrived from Havana on the —— of July, went into her berth on the south side of Dry Dock Wharf (separated from the Vesta by the width of the wharf only), and re-

mained there until the 1st of August. Thus was the Vesta exposed, like the Sullivan, to two sources of infection.

On the 5th of August one of her crew was seized with yellow fever, and was sent into the Marine Hospital on the 7th; on the 9th another man was attacked.

Mr. Garvey, an Irishman, residing at No. 20 Pinckney Street, was employed in pumping out and disinfecting the barque Aquatic, during the greater part of which time he worked in the hold. While heated by work he was wet by rain and was attacked with yellow fever on the 11th of August, and died on the 15th. About the same time, another Irishman, Mr. McNeal, who worked with Garvey in the hold of the Aquatic, sickened with yellow fever, but recovered. These were the only men who were employed *in the hold of the vessel.* Of fifteen men employed on the deck, and who did not go into the hold, two died.

It is evident from this that the barque Aquatic was the second source of the introduction of the fever, and would have been capable, had it not been imported by the Columbus and Concha, of giving rise to its subsequent prevalence.

4. It has been stated that no terrene or aquatic difference existed in the docks in which lay the Columbus and Concha, and other docks; none, as admitted even by those members of the profession of the city who believe in the domestic origin of the fever.

5. It was not until three weeks after the outbreak of the disease at Central and Dry Dock Wharves, that cases occurred among the crews of vessels in other docks, even two or three removed from those centres.

6. Vessels arriving at the same time as the schooners Monterey, Susan Cannon, &c. (the histories of which are given above), but going into other docks, did not have their crews affected.

7. It is worthy of remark that the cases which presented the greatest malignancy and the greatest proportionate mortality were those which occurred on the vessels, the berths of which were the same as those of the Columbus and Concha; thus, the schooner Maine Law lost six men—her whole crew—three of whom were natives of the Azores, and who, in regard to comparative insusceptibility to the disease and liability to recovery, may be ranked with Spaniards, Portuguese, and Italians.

8. Other Spanish, and two American vessels, which arrived from ports in Cuba at or about the same time as the Columbus and Concha, and had had no cases of fever on board, either during the

passage or subsequently to their arrival, did not become centres for the spread of the disease.

Let us now trace its steps in the city with the object of showing the connection, immediate or remote, of the first few cases, with the shipping. The case of Mr. S——, above narrated, was, there can scarcely exist a doubt, contracted by his visits to the Concha. Mr. F——, clerk to Mr. Dulin, whose office is likewise on the wharf at which the Concha was moored, and who likewise visited that vessel, was attacked on the 17th of August, and died at his residence in King St. on the 27th.

An Irish woman, in the service of Mr. G. M., on East Bay Street, opposite to North Commercial Wharf (where the barque Aquatic lay, while in a foul state, during two days), was attacked on the 12th of August and died on the 16th with black vomit. In this case, a month intervened between the arrival of the Aquatic and the attack of the fever; but instances are on record in which the latent period has been prolonged beyond a month.

Mrs. Gorham, Irishwoman, residing in Calhoun, near Elizabeth Street, was attacked on the 15th of August, and died with black vomit on the 18th. This woman's husband worked, I am informed, on the deck of the Aquatic, so that although he did not take the disease himself, yet it is probable that it was communicated to his wife by the fomites of his clothes.

Two Germans residing at the foot of Hasell Street, not far from the berth of the Aquatic, were attacked on the 19th of August, and the cases soon multiplied indefinitely in the streets adjacent to the wharves.

It is thus apparent that the origin and behavior of the fever this year does not differ from that of former years as far as our information goes. It occurs first among the shipping, and then spreads slowly or rapidly, as the case may be.

Now when so many coincidences of the same nature occur, as have been above enumerated respecting the origin of the fever of 1854, supported, as they are, by coincidences of the same nature in former epidemics in this city, they cannot be considered as the result of chance or accident, but logically prove the relation of cause to effect, thereby establishing the *law* governing the origin of the fever, which may be thus stated: Given, the antecedent or *causa sine qua non*, a high degree of heat long continued, and the application of the specific poison, or *causa causans*, from without, and the effect, the fever, follows.

Of equal importance with, and nearly allied to, if not identical with the question just discussed—the importation or non-importation of the fever—is that of its communicable or non-communicable (contagious or non-contagious) nature; and the few remarks which will be made respecting it shall have reference only to what occurred that year.

In my opinion, this question is affirmatively answered by the instances already given of the extension of the disease to the crews of vessels lying contiguous to the Columbus and Concha, and to the two clerks in offices on the wharf at which lay the latter vessel. It is a matter of perfect indifference whether it was the poison contained in the Spanish vessels, or the cases of fever which occurred on one or both of them, which communicated the disease to the crews of the Sullivan and other vessels lying in the same or adjoining docks, and to the two clerks. It can be communicated in the one as well as the other way, since the two modes do not differ in principle. In the one case, it is equivalent to expanding or diffusing into the atmosphere of Charleston a portion of the yellow fever atmosphere of Havana, containing the *materies morbi:* in the other, the *materies morbi* is given off immediately and directly from the diseased body. It is enough to know that the poison *is diffused* through the air; into whom it may penetrate and reproduce itself is a matter of no moment. Who will pretend to limit the distance of the contagion of variola? Even malarial fever has been contracted by the crews of British vessels engaged in the suppression of the slave trade, 40 miles from the coast of Africa. But inasmuch as close approach to the sick is required by some in proof of the transmission of the fever, I shall mention the few instances of this character which I have been able to collect.

At the commencement of an epidemic of any disease, it may be easy to ascertain definitely the fact of the disease attacking persons who have had intercourse with the sick; but at a later period, when the poison shall have become diffused, intercourse with the sick, or subjection to the atmosphere of a house in which one or more persons are sick, becomes valueless as a test of its communicability. For this reason, no single epidemic is likely to furnish many instances of transmission.

I have already narrated the case of Mr. S——, clerk to Messrs. Hall & Co., whose place of residence was the Planter's Hotel, Church Street. The Irish woman who washed his clothes during his sickness took the disease before he had quite recovered. A very short

time after, a son of the hotel-keeper likewise took the fever, and it then spread over the premises. It must be borne in mind that the Irish woman took the disease at a time when it was still confined to the shipping, or those immediately connected with it, as was Mr. S——.

The daughter of Mrs. Gorham (whose case has been twice mentioned), a child two years of age, who slept with her mother during her sickness, was seized with the fever the day preceding the mother's death, and died herself, two days after her mother, with black vomit. Mrs. Gorham's case seemed to be the centre of radiation of the fever in that locality.

The following cases are reported on the authority of Dr. William Hume (*Charleston Medical Journal and Review*, Vol. X. No. 1).

"On the morning of the day on which Mrs. Gorham died, her friend Ann Corran (Irish), residing in Mill Street, Cannonborough, visited her, found her assistance necessary; remained, nursed her, and laid her out, and finally attended her funeral (this was on the 19th of August); she returned to Mill Street the next afternoon, was herself seized with the fever on the 25th, and was immediately removed to the Almshouse Hospital, where she died on the 3d of September." Cannonborough is in the northwestern part of the city, and no case of fever had occurred anywhere in that section at the date of Ann Corran's attack. The occurrence of other cases in the family was probably prevented by her being early taken away.

"An Irish woman, living opposite to the Marine Hospital, in Franklin Street, was in the habit of obtaining water from the cistern in the yard of the hospital; she never saw the yellow fever patients: she never entered beyond the basement; yet she was the first case in the street.

"An acclimated lady, residing in a then healthy portion of the city, determined to visit a sick friend. She inadvertently took her daughter with her; while there, she thought of her imprudence in taking the child, and immediately sent her home; this child was the first to develop the disease in her own home, and suffered the penalty of her mother's thoughtlessness. Other members of the family soon took the disease, which subsequently infected the neighborhood."

During the prevalence of the fever in the city, Mrs. Grove, the wife of the engineer of Potter's Mill, on the western bank of the Ashley River, sickened with the fever and died. A few days after her death, Mr. Grove went, with his son, about 8 or 10 years of

age, to Wilmington, N. C. Three or four days after his arrival in that city, the boy was seized with yellow fever, threw up black vomit freely, but recovered. His aunt, in whose house he was staying, who nursed him during his sickness, took the fever and died with black vomit. A few days after this lady's death, a lady in an adjoining house took a fever, of which she died. Relative to the nature of the last case, there was a difference of opinion among the physicians who attended her; the regular medical attendant being of the opinion that it was a bilious remittent, and the consulting physician, who had attended the boy and his aunt, pronouncing it of the same nature as theirs, viz., yellow fever. Subsequently to this, a man was attacked about one block distant, and died. These were all the cases which were observed in that city. The above facts were communicated to me by Dr. J. F. McRee, of Wilmington; and I can only regret that his letter has been mislaid.

Would not proof of the same *kind* and *degree* as this case furnishes, be admitted as sufficient to account for the introduction of variola, scarlatina, or rubeola, into a place? If so, how can its applicability to the communication of yellow fever be denied?

The disease did not visit like a census-taker; but when it once effected an entrance into a house, all the inmates, white and black, who were liable to it, took it in rapid succession; two, three, four, or more members, and in some instances the whole family were simultaneously sick. I have known the members of two families, consisting of eight and eleven persons respectively, down with it at one and the same time; a circumstance of common occurrence in the Dengue of 1850.

The consideration of the last topic leads me to adduce, in support of the contagiousness of the fever, as manifested in this epidemic, the calculation made by the celebrated mathematician, Bishop Brinkley, of Ireland, relative to that of any disease. This calculation, to which reference is had by Dr. Stokes, in his admirable lectures on Fever, recently published, shows that an overwhelming number of chances—189,000,000—exist against the occurrence of a certain event, such as the sickening of *eleven* out of *twelve*, of a family, in a particular district, if the sickening of one did not promote that of another, or in other words, if the disease were not contagious. Now, after making a deduction of 100,000,000 for the effects of local influences, which element, as Dr. Paget correctly observes, did not enter into Bishop Brinkley's calculation,

and which should be subtracted, there would still be left 89,000,000 of chances to 1—a result more than amply sufficient to confirm the doctrine of the communicability of the disease. But even if local causes were to reduce the probability to 1000 to 1, yet Dr. Paget admits that this latter probability would be sufficient to carry conviction to any candid person.

In the circle of my practice, there was a family consisting, white and black, of fourteen members; of this number thirteen had the fever in different degrees, four severely; but in all it was well marked. And it is probable that other practitioners saw, in some instances, an equally large proportion affected.

D. J. CAIN, M.D.

REPORT

ON THE

EPIDEMICS OF LOUISIANA, MISSISSIPPI, ARKANSAS, AND TEXAS.

BY

ERASMUS D. FENNER, M.D.,
OF NEW ORLEANS.

REPORT ON THE EPIDEMICS OF LOUISIANA, MISSISSIPPI, ARKANSAS, AND TEXAS.

THE reporter of the American Medical Association, on the Epidemics of the above named States, after expressing his regret at not having been able to perform the duty assigned him, for the year 1854, now respectfully submits the following facts and observations relative to the two principal epidemics that have prevailed in this region during the two years 1854 and 1855. It will be seen that the bulk of this report is made up of contributions kindly furnished by my professional friends, to whom I must be allowed the privilege of thus publicly expressing my grateful acknowledgments; for without this material aid it would have been impossible for me to have prepared a satisfactory report, on account of the numerous and pressing engagements upon my time.

Yellow fever and Cholera are the only epidemics to which we invite attention; and especially the *former*, as it has been the most extensive in its range, and most fatal in its effects: the latter (cholera), may be passed over with a few general remarks at the close of this report.

I feel authorized to say the yellow fever of the last two years in New Orleans was fully as malignant as the memorable epidemic of 1853, and the sufferers and victims would have been equally numerous, if there had been as many *susceptible* subjects exposed to it. When we recollect that upwards of twenty thousand people in this city suffered and survived the fever of 1853, it will readily appear that the epidemic influence in the last two years must have been very severe, to have caused about 2500 deaths each year. At some other places in my district this disease prevailed with equal malignity; as in Galveston, Texas, in 1854, and in Vicksburg, in 1855. It is a fact worth mentioning, that the city of Galveston, a seaport directly on the Gulf of Mexico, and in constant communication

with New Orleans and Houston, Texas, escaped this epidemic in 1855, whilst both of the cities named were severely scourged, and this too, without the supposed protective agency of *Quarantine*.

It was remarked, in my last report, that the area or range of yellow fever was evidently enlarging from year to year. Subsequent observations furnish farther evidence of this fact. For instance—the highest point on the Mississippi River at which the epidemic of 1853 prevailed, was the little town of Napoleon, about two hundred miles above Vicksburg, and the same distance below Memphis. In that year, upwards of sixty cases of the disease were carried into Memphis, and more than forty of them proved fatal, no effort whatever being made to isolate the disease, yet the citizens of the place did not suffer in the least. It would not prevail there at that time; but, strange to say, in 1855 the disease broke out there, and prevailed as an epidemic, the first cases being traced by Dr. Shanks to a steamboat plying between that place and New Orleans. Memphis is a city of about 15,000 inhabitants, situated on a high bluff, and was thought to be secure against the yellow fever of New Orleans, from the fact that hundreds of cases had been brought there without any injurious effect upon the citizens. Nevertheless, we have the reliable testimony of the late Dr. Wyatt Christian, of Memphis, for stating that, in 1828, when the place was only a small village, yellow fever did break out near a large pile of decaying cotton-seed, and prevailed to the extent of forty or fifty cases. The offending cause was then removed, and the disease vanished; so that some change must have recently taken place in the locality of Memphis, which either caused the disease to spring up spontaneously, or furnished a *nidus* favorable to its regeneration and extension when once introduced from abroad.

Yellow fever has also extended, in another direction, further than it ever did before—I mean the interior of the country, remote from the great river. In 1854, the village of Brandon, in Mississippi, the terminus of the railroad leading from Vicksburg, and about sixty miles distant from that place, was severely scourged for the first and only time. Brandon is situated in a high pine region, and the only recent change that has taken place in the locality was made by the deep cuts for the railroad. This road runs through Jackson, the capital of the State, which has been scourged by yellow fever for the last three years. Likewise, the village of Canton, about twenty-four miles from Jackson, and seventy-four from Vicksburg, was severely scourged in the summer and autumn of 1855. The

railroad has been recently extended from Jackson to this place, though it was not completed at the time yellow fever prevailed. Besides the cuts into the ground necessary for the railroad, I learn there was a brick yard in the town, which made a large pool of stagnant water, that may have had some agency in producing disease. The valuable contributions to this report obtained from my correspondents in different parts of the district, will be found to contain much interesting information relative to the behavior of yellow fever in the interior of the country. The authors of these papers appear to differ in regard to the origin and transportability of the disease, but the reader may form his own conclusion from the facts given.

In my last report, I expressed the belief that yellow fever was *one of the forms or varieties of endemic fever* that originates spontaneously in New Orleans, and *most generally, was not at all infectious*, or capable of being transported to distant and dissimilar localities, and there communicated to the resident population without the assistance of any other deleterious influence. At the same time, it was admitted that many occurrences of recent date in this region, tended strongly to prove that the *materies morbi* could *sometimes* be conveyed from an *infected* to a *healthy locality*, where, most probably, it would not originate, and then be communicated from person to person like measles, scarlatina, and hooping-cough. This is the doctrine of "contingent contagion," so strongly opposed by the distinguished Dr. La Roche, of Philadelphia.

I confess it is contrary to my first convictions as well as to all my observations up to the year 1853, but I trust I shall never become so bigoted in any belief that I cannot possibly be convinced of its fallacy, if it should be false, as is liable to happen in all human judgments. Dr. Rush once proclaimed the belief that yellow fever was an imported and contagious disease, but afterwards acknowledged his error and obtained much credit for magnanimity, by openly recanting a published opinion. In like manner I have but little doubt that if Dr. La Roche had spent the last three summers in this region, he would have found sufficient cause to modify his opinion on this point. It is well known that since the days of Rush the *non-contagion* of yellow fever has been the doctrine of all American Professors, with the exception of the late Dr. Hosack, of New York, and Dr. Dickson of Charleston. And this is the doctrine that was instilled into the mind of nearly every physician now practising in this region; but an extensive intercourse with the

profession leads me to say, in all candor, that the experience of the last three years has greatly modified opinion on this subject.

Some physicians still deny, *in toto*, the contagion of yellow fever: but I think the majority of those who have recently been brought in contact with it in this region now admit, that under favorable circumstances and within a limited region, the morbific cause may be conveyed from one place to another, and take effect upon persons thus exposed to it. The mass of the people who have been the sufferers, are almost unanimous in this belief. But, to the philosophical inquirer after truth, is presented an array of facts apparently of the most contradictory character in relation to this question. Why should the disease be contagious at one place and not at another? in one season and not another? Why should it now prevail epidemically, *for the first time*, at a town or plantation on the Mississippi River, which has always been in direct communication with New Orleans, and into which cases of the disease and all sorts of goods have been introduced from an infected district, hitherto with impunity? Formerly, when it broke out at one of its old *habitats*, as New Orleans, Mobile, or Natchez, cases might be taken thence into the neighboring country, without endangering the inhabitants; but not so now. It seldom fails to spread when taken to the neighborhood of these places.

When the disease now breaks out for the first time at a town far up one of the navigable streams, the inhabitants flee with consternation to the surrounding country, carrying in their systems the seeds of infection, which then mature and develop the fatal fever, but incapable of spreading among the attendants on the sick; but perhaps a like impunity will not be observed a few years hence. Such are some of the curious and apparently antagonistic facts that require to be reconciled and explained before we can claim to understand the true nature and character of yellow fever.

After the great epidemic of 1853, the citizens of Louisiana were so fully persuaded of the *foreign origin and contagiousness* of yellow fever that they loudly demanded of their Representatives in the Legislature to establish quarantine for the protection of New Orleans and the interior of the country against the incursion of their insidious enemy. The effort was made at the Session of 1854, which took place in January and February, but failed for want of proper management by the advocates of the measure. In the following summer the disease again broke out in this city and prevailed with

terrible malignity. At the succeeding session of the Legislature quarantine was established, and has been enforced ever since.

We will proceed at once with an account of the rise and progress of the last two epidemics in New Orleans.

On the 8th of April, 1854, a lady arrived here from Havana, in the last stage of yellow fever, with which she had been attacked soon after getting out to sea. She was taken to the St. Louis Hotel, one of the largest in the city, and died on the following day, with *black vomit and yellow skin.* It had no injurious effect whatever upon the inmates of the house.

The next case pronounced yellow fever was of a somewhat questionable character. It occurred in the upper part of the city, near St. Mary's Market, in a man of rather intemperate habits, who had been about the city four or five years, running in and out on steamboats, but had never had yellow fever. He was employed painting a steamboat on this side of the river when he was attacked with fever. Had nothing to do with ships. He died on the 18th of June, and ninth day of illness; he threw up something very like black vomit, and the body turned yellow. The case is only considered questionable from the fact that it had been treated by a physician of not very fair standing, who had given it large quantities of brandy and morphine, which may have caused gastro-duodenitis and effusion of blood from the mucous membrane. It thus appears that this case occurred *more than two months after* the case at the St. Louis Hotel, and about a mile distant.

The next, and probably the first unquestionable case, was admitted into the Luzenberg Hospital, on the 17th of June. The subject was a robust German aged about 30 years, who had been in this country three years, mostly engaged on steamboats running from New Orleans to St. Louis and Louisville. Arrived here from one of the latter places on the 12th of June, and stopped on Fulton Street, between 8th and 9th Streets, which is high up in the Fourth District, or Lafayette. He was attacked on the 16th of June, and entered the hospital on the 17th, as above stated. He died on the 4th day of illness, after throwing up large quantities of *black vomit*, and the body turned yellow. Dr. Langenbacher, the resident physician, had no hesitation in pronouncing it a genuine case of yellow fever. So here is a case occurring at least a mile distant from the last one, and taken sick very soon after coming into the city, not from an infected place or vessel, but from the upper country.

We are indebted to Dr. Langenbacher for notes of the following cases, which were amongst the earliest that occurred this summer.

CASE.—A German girl, who had been in the city seven months and lived at 74 New Levee Street, between Notre Dame and Girod, near the river, and about midway the length of the city, was brought to the Luzenberg Hospital, on the 24th of June. She proved to be a plain case of yellow fever; had severe hemorrhage from the nose, and the eyes turned yellow—recovered.

CASE.—A German servant girl, aged 17 years, residing on Jefferson Street, not far from Jackson Square—been in the city about six months; was taken to the Luzenberg Hospital on the 29th of June, and died with black vomit on the 2d of July.

CASE.—I. S., a German baker, aged 32 years—been in the city six months—resided on Fourth Street near Rousseau—was brought to the Luzenberg Hospital on the 30th of June; then sick three days—began to throw up black vomit the evening of the day he entered, and died on the following day (July 1st), with black vomit and hemorrhage from the bowels. This man had lived high up town, worked constantly in the Louisiana Bakery, and never went about delivering bread in the city, or on board of ships.

CASES IMPORTED FROM HAVANA.—On the same day the case last given entered the hospital, a Spanish sailor was admitted into the same room, in the last stage of yellow fever. He was brought from a vessel which had just arrived from Havana, with several cases of yellow fever on board. This man died on the 3d of July. Several other cases were admitted from the same vessel, which lay near the lower Cotton-press, at least two miles below the place where the case last given originated. It is nevertheless true that immediately after the Havana vessel arrived, yellow fever broke out in the adjacent shipping, and became epidemic in that part of the city, long before it did in the upper part, where the first cases occurred. What agency the vessel had in bringing about this event, is left for the reader to judge. It is due to the truth of history to say, however, that yellow fever epidemics do not always break out in the same part of the city, but sometimes in one and again in another. We have already shown that there had been unquestionable cases of yellow fever in the city before the arrival of this vessel from Havana. On the 30th of June, I was informed by Dr. W. that he had seen several cases around Gormley's Basin, in the rear of the city, where some of the first cases occurred in 1853.

At a meeting of the Physico-Medical Society on the 3d of July, one of the members stated that he had recently seen a case of "*gastritis*" terminate fatally with *black vomit*.

First Case at the Charity Hospital.—L. H., a German seaman, aged 22 years, was admitted into ward 22 on the 13th of July. Said he came last from Rio Janeiro, where he had remained a month. *Six weeks ago* he came to New Orleans on board the ship Caroline, and was not attacked until he had been here five weeks, viz., on the 8th of July. The case was almost hopeless when admitted, and died on the 14th of July with copious *black vomit.*

The next case admitted into this hospital was on the 22d of July. The next on the 24th of July. On the 28th there were eight cases in the house, and by the 1st of August the number of admissions got up to 36. The disease increased so rapidly that in the month of August the admissions amounted to 683, and in September to 1291. From that time it steadily declined.

But let us turn back a little to some more imported cases. On the 14th of July the barque *Tonquin*, Captain Hill, arrived here from Baltimore, having called and remained a week at Havana, where there was a great deal of yellow fever, especially among the shipping. Captain H. left there on the 1st of July. Soon after getting to sea, fever broke out on board, but not very malignant. Captain H. was attacked the day he got into New Orleans, and had a pretty severe spell. As before stated, the disease was prevailing here when this vessel arrived; she took position in the Fourth District, below Jackson Street, but I could not trace any injurious effects directly to it. The disease did not become epidemic in that district until about three weeks after her arrival.

So much for the origin and commencement of this epidemic, which finally overran the whole city, and proved as fatal in proportion to the number attacked as that of 1853. I leave the reader to judge from the facts given, which were collected carefully at the time of occurrence, whether the disease originated in the city or was imported from abroad. My own opinion is that it originated from local causes belonging to the city, and in precisely the same manner that it always originates here. After the middle of May, in this city, the *milder* forms of fever (intermittent and remittent bilious) gradually run into the yellow fever type which, if the season be a very sickly one, gains complete ascendence, but does not supersede entirely all others, and reigns for a period of seven or eight weeks; then gradually falls back again into the milder types, and disappears after cold weather sets in. The following table will sufficiently prove the truth of this observation.

Table showing the number of Fever Cases of all kinds admitted, monthly, into the New Orleans Charity Hospital, during the year **1854**; *also the admissions for all diseases during the same period.*

1854. FEVERS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Intermittent	258	130	156	129	101	140	222	212	186	245	190	203	2172
Remit. bilious	18	20	14	11	12	66	70	97	17	52	49	29	455
Continued	3	2	3	1	6	9	4	2	...	1	5	3	39
Typhoid	38	20	12	13	22	12	15	10	7	22	29	37	237
Typhus	7	5	3	8	7	...	2	2	...	...	4	13	51
Congestive	...	...	...	...	...	1	...	3	...	1	...	2	7
Ephemeral	5	3	2	3	3	4	10	17	10	6	8	2	73
Pernicious	2	2	2	1	...	3	2	10	6	5	...	..	33
Scarlet	2	...	1	1	3	2	...	2	...	1	...	3	15
Inflammatory	...	2	2	1	2	5	5	6	...	...	3	...	26
Cerebral	...	...	...	1	...	...	...	1	...	...	...	...	2
Rheumatic	...	...	...	...	...	1	1	2	1	1	7	...	13
Gastric	...	...	...	...	...	12	18	7	11	...	14	12	74
Nervous	...	...	...	...	...	...	...	1	...	1	15	6	23
Chagres	1	2	...	...	...	...	11	8	1	3	...	...	26
Catarrhal	...	...	...	...	...	1	5	2	...	7	4	1	20
Yellow	...	...	...	...	...	...	36	683	1291	606	133	5	2754
All fevers	334	186	196	168	156	256	401	1065	1530	951	461	316	6020
All diseases	1092	720	774	669	675	783	964	1664	1902	1454	1188	1318	13303

It will be seen that *nearly half* the cases admitted into the hospital this year, were *fevers;* and of these, more than one-third were *intermittents.* During the three months that yellow fever prevailed epidemically, nearly one-third as many cases of intermittent and remittent fever were admitted. I have repeatedly shown that yellow fever never breaks out suddenly here, presenting its characteristic features from the first; but, on the contrary, that the first cases are generally of a very doubtful character, looking so much like bilious remittent fever that physicians cannot be brought to agree on the diagnosis until a number of cases have died with black vomit. It will be remembered, that the first cases of this year were observed in different parts of the city nearly a month before any case was admitted into the Charity Hospital; and particular attention is invited to the number of admissions for intermittent and remittent bilious fevers about the time that yellow fever appeared, and during its entire prevalence, as shown by the table. This is the case in New Orleans every year. It will be seen, further on, that my correspondent, Dr. Beazly, of Mississippi, noted the same thing in the epidemic at Cooper's Wells.

The total mortality, in the whole city, for this year, was 11,347: of which there died of yellow fever 2,316, and of cholera 880.

From New Orleans, as a starting-point, yellow fever spread far and wide into the interior of the country, the attendant circumstances appearing to support the opinion that it was conveyed from place to place, and communicated by infection. At the close of this epidemic, the popular call for the establishment of *quarantine* was so general and urgent, that a law was passed for this purpose at the next session of the Louisiana Legislature, which met in January. How far the hopes and expectations of the advocates of this measure were realized, will appear from the occurrences which are about to be detailed. It is proper to state, however, that those of us who believed in the *local origin* of yellow fever, and expected no benefit from quarantine, withheld all active opposition to the measure, and were willing to give it a fair trial. It was evident that the public mind was so strongly biased in favor of it, that nothing else would be done to protect the city against the ravages of this pestilence until quarantine had been fairly tried. The law was put in operation on the first day of June, 1855, and it must be confessed that the importation of yellow fever from abroad was entirely prevented; nevertheless, we were again scourged by a severe epidemic.

EPIDEMIC OF 1855.

The editors of the *Medical News and Hospital Gazette* (August, 1855), have furnished so full and correct an account of the first cases of this epidemic that I cannot do better than insert it entire.

"YELLOW FEVER.—In the June and July numbers of our journal we reported all the genuine cases of yellow fever (eleven in number) which had occurred in the Charity Hospital up to June 25th. Our readers may rely on the data furnished, inasmuch as we promptly rejected all cases in relation to which there was any real doubt as to the nature of the disease, and we have thus been able to furnish them the most ample and reliable material on which to exercise their speculative propensities—more complete and more reliable than can be found elsewhere, as we recorded our notes at the bedside of the patients, and accepted nothing second-handed.

"Just at this time, when the great question of quarantine is agitating the public mind, the most interesting question connected with these cases relates to their *origin*, and in reviewing them we shall

merely advert to facts, without intruding our individual opinion. Every intelligent mind will make its own inference at last and to afford the material for this purpose is our peculiar province.

"In our June number is reported the case of John Hailey, who entered the Hospital on April 30th and died on 3d May. He seems to have been taken sick on his way down to the city on board a steamboat (either the Louisa or Rapides), on which he acted as cook. He was a native of Ireland and unacclimated. Yellow fever was not suspected at the time of his illness, and he was considered a case of "bilious fever" until black vomit made its appearance. No autopsy ever revealed more clearly all the characteristics of genuine yellow fever. Although the evidence is not *positive*, still, all the data tend to show that the individual had no communication with the shipping; he was taken sick away from the city, though he was running to and from the same every ten or fifteen days on one of the boats named.

"The excitement caused by the case of Hailey in the Hospital soon subsided; none of the patients in the ward where he died took the disease, and things went on quietly until the 19th June, when a very severe case entered ward 22, and died on the 20th, after having thrown up black vomit profusely. This man's name was William Barneman—German—aged 21 years—one month in New Orleans—from Girod Street—worked on the levee for steamboats—taken sick on the 15th June. Autopsy revealed plenty of pure black vomit in the stomach.

"However, by reference to our reports in July number, it will be seen that a case of yellow fever, Carl Draugod, really appeared in the hospital as early as the 15th of June. He was seen by the visiting physician of the ward for the first time on the morning of the 16th, and although suspected at the time, nothing was said about it until the morning of the 19th, when he was bleeding freely from the nose—having, also, bled from the gums quite freely on the 18th, or the fifth day of the disease. All who saw this case pronounced it yellow fever.

"Thus, then, the man Draugod (of June 15th) was the first case that appeared in the hospital after the case of May 3d, or forty-three days previously. Let us see who Draugod is:—

"He is a native of Germany, from Liverpool *direct*, and had been in this city five weeks when taken sick—had been acting as servant

in the beer saloon of Frank Weber[1] ever since his arrival, and had no connection with ships. During this man's illness in the ward sundry cases of intermittent and remittent fever, diarrhœa, etc., have occupied the beds around him, but none took yellow fever.

"There is no evidence, then, of Draugod's having 'caught' the disease from any person or bale of goods, etc.; he was not only the first recorded case for the month of June, 1855, but he was simply an unacclimated German, thrown amongst us at the beginning of our summer season, and notwithstanding he worked within doors and was not exposed to the vicissitudes of the weather, we find him taking yellow fever in its hemorrhagic form at a very early date—he having been sick two days before he entered the hospital.

"We next come to the case of Andreas Benz—German—in America three years—in New Orleans three weeks—last from Louisville, Ky. This man is a carpenter by trade, and was last at work near St. Mary's Market—entered ward 23 on 19th June—had been sick with diarrhœa nineteen days, and entered the ward with fever and diarrhœa. Died June 21st.

"On the same day that Benz entered (June 19th), John Kramer entered ward 24. This man was a German—aged 23 years—five years in America—six months in New Orleans—common laborer, but had been working in Murphy's Hotel, on St. Charles Street (next door to the St. Charles Theatre), for two weeks previous to being taken sick. He distinctly avowed that he had no communication with the shipping. Recovered.

"These two individuals, then (Benz and Kramer), are found entering the hospital on the same day—one from a carpenter's shop near St. Mary's Market (one of the filthiest portions of the city), the other from St. Charles Street, in the very heart of the city, and where most attention is paid to cleanliness. Both were strictly unacclimated; one in the city but three weeks, the other six months.

"Next comes Edward Tilden—Irishman—has been in America nine years, but has never resided in New Orleans—has been running to and from the city on steamboats for several years—entered ward 25 on June 20th, having been taken sick four days previously (16th)—was taken sick on his boat and went thence to a boarding-house on Levee Street. It is thus seen that Tilden was one of the

[1] The patient being a stranger in the city, could not tell us the name of the street on which Weber keeps his saloon, though he says it is not near the shipping; and we have failed to find it in the City Directory.

first taken sick, he being only three days behind our first patient, Draugod.

"Three days now elapse, and on the 23d June we find the man Philip Lyskchyler entering ward 22, with an intense attack of yellow fever, which terminates fatally on the morning of the 24th. He is a German—*direct* from Havre, on ship Rome,[1] and has been in New Orleans but three weeks—has been working on the levee, near post 24—taken sick three days before he came in, or on the 20th June.

"Next comes George Weintz—German—entered ward 22 on the 20th June. He is, also, from ship Rome (emigrant), and says he knew Lyskchyler well—has been sick twenty-four hours—is from a boarding-house near St. Mary's Market—has been doing nothing since his arrival in this city—merely lounging about his boarding-house. Recovered.

"These two men (Lyskchyler and Weintz) were also wholly unacclimated, having been in New Orleans but three weeks. The former was laboring on the levee in the sun, the other was under shelter and doing nothing; yet both took the disease.

"We now come to Maria Shualtz, who was brought to the hospital in a hopeless condition on the morning of the 25th June. She could give no account of herself, but her friend says she is a native of Germany—has been in New Orleans eight months—is from the corner of Claiborne and Poet Streets (Third District, and far back from the river), and was taken sick on 22d June. This patient came from a locality far removed from any of the other cases, and a great distance back from the river, and, consequently, from the shipping.

"Lastly, we have the man Joel Shoemaker—native of Ohio—in New Orleans six months, though recently returned from a visit to Ohio—lives in Lafayette, at a hotel near the Stock Landing—entered ward on afternoon of 25th June, and died 2d July. This man and Maria Shualtz entered the hospital on the same day—both intensely attacked—yet coming from opposite ends of the city, and one from the river bank, the other from the rear of the city.

[1] We are indebted to Dr. Fenner, of this city, for the following notes in relation to ship Rome, he having visited her in person: "Ship Rome, Capt. Moulton—American vessel—arrived from Havre *direct* on 3d June, 1855—was hailed at quarantine, June 2d, examined and passed—brought but little cargo and 162 German emigrants—had little sickness at sea, and this confined to children, seven of whom died. Most of the emigrants left for St. Louis, June 4th. Capt. M. has now but one man on board—no sickness, and has heard of none in the neighborhood of his vessel. Ship Rome lies at post 24, about three squares above St. Mary's Market."

"The data being now furnished, it remains for those who preach the doctrine of the importation of yellow fever into New Orleans to make out their case. We cannot close, however, without annexing a summary of two cases which we regard as closely allied to the subject: they will speak for themselves:—

"June 15th. Pan Mordin—Swede—entered ward 17—he is a clerk—last from Chicago—five months in New Orleans. This man was entirely delirious, and presented all the symptoms of delirium tremens—fever arose on the day after his admission, and on the 19th he died of as pure black vomit as was ever seen.

"June 17th. Herman Ferringer—German—aged 20 years—last from Chicago—in New Orleans six months—entered ward 22—occupation, brewer—presented all the symptoms of "pernicious intermittent fever," but died on the 19th with some symptoms of yellow fever—so decided as to lead to the prediction that black vomit would be found in the stomach after death. The autopsy revealed genuine black vomit in the stomach.

"HEALTH OF OUR CITY—JULY 25th, 1855.—The 25th of July has arrived, and we find ourselves again called on to render an account of the doings of disease in our city during the past month. Our last report was anything but a flattering one, and we had hoped to be able, this time, to present our readers a more agreeable picture. To some extent these hopes have been realized, though there is nothing in our existing condition which can be construed into cause for self-gratulation. Our last report showed us to be just emerging from an epidemic of cholera, which had, in a few short weeks, killed near eight hundred of our citizens, in addition to a large mortality by other diseases. Since the issue of that report, the number of deaths by this disease have gradually declined, until it has almost disappeared—there being but 8 deaths reported for the week ending July 22d. In our last issue, however, we announced the appearance of yellow fever here by reports of ten undoubted cases which had been seen in the Charity Hospital. Since that time the disease has steadily increased, until for the week ending July 22d we notice 119 deaths from yellow fever alone. Up to the present time the total number of deaths by this disease reported is 201—to July 1st, 6; for week ending July 8th, 32; for week ending 15th, 44; and for week ending 22d, 119.

"Concerning the origin of this disease for the present season we have treated elsewhere. So far as we are capable of determining, there appears to be nothing approaching a uniform type; we have

noticed all grades, from that which is so mild as to be difficult of diagnosis, to that which partakes of the true congestive nature, and kills within forty-eight hours. So far, we are satisfied that fully nine-tenths of those attacked are recently (within nine months) from a cold climate; a large number are recent emigrants, and a number are foreigners who have been living in the Northern or Western States, who have recently come to the city, and among these we notice by far the greatest mortality in proportion to the number attacked. The cause of this we leave for others to determine, though we are inclined to attribute it to the irregular habits of the individuals—they, by their own confessions, proving the irresistible impulse of every Western young man to "get on a spree" as soon as he lands at our wharves, and an attack of yellow fever based on intoxication is about as little amenable to treatment as a patient in the collapse stage of cholera.

"One very important point we have noticed in connection with the yellow fever in existence here, is that quite a number of persons have been attacked by the disease within three to six days after their arrival in the city. This certainly tends to show that the existing fever cause, be it what it may, has acquired considerable potency.

"It is not for us to speculate on the future; we have, as journalists, to deal only with facts; so far, however, we think we may safely say that we will be spared a re-enactment of the scenes of 1853. For the week ending July 23d, 1853, the number of deaths by yellow fever alone was 429; while for the corresponding week of this year we have but 119. This difference may be in *some* degree the result of a deficiency of material, but it cannot be altogether so; the fever-producer must be less powerful than it was then.

"We have noticed a fact this season, which, although nothing new, is certainly very interesting. Several persons who passed safely through the epidemics of 1853 and 1854, and were then unacclimated, have had the disease severely within the past three weeks. One man is worthy of especial notice in this place. He acted as nurse in the hospital during the summers of 1853 and 1854, and passed unscathed; and this season the poor fellow died of black vomit on the fifth day of the disease."

Yellow fever steadily increased until the week ending the 19th of August, during which week the number of deaths from this disease alone amounted to 394. From that time it declined in the

same regular order that it followed when on the increase: thus weekly, 357, 301, 255, 150, 89, which was the week ending September 23d.

As our Board of Health publishes only the weekly number of deaths, without giving the list of diseases, we are not able to make up any statistics from the general mortality of the city. All we can do in this way must be obtained from the records of the Charity Hospital. The following table will show the relative proportion of the different types of fever admitted into that Institution during this year.

Table showing the number of Fever Cases of all kinds admitted monthly into the New Orleans Charity Hospital during the year 1855*; also, the admissions for all diseases during the same period.*

1855. FEVERS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTALS.
Intermittent	162	145	101	137	153	215	176	128	180	305	290	238	2230
Remit. bilious	18	20	17	14	62	77	65	36	29	42	36	17	433
Continued	2	1	3	1	2	2	1	2	...	...	1	4	19
Typhoid	38	23	9	13	33	37	19	14	28	21	13	19	267
Typhus	10	7	6	3	5	6	3	1	...	1	1	1	44
Congestive	...	...	...	...	...	...	2	1	...	...	2	...	5
Ephemeral	3	1	1	1	1	1	...	...	3	...	...	...	11
Pernicious	4	...	2	3	2	5	4	2	1	7	1	...	31
Scarlet	5	1	...	1	2	...	...	...	...	...	...	...	9
Chagres	1	...	...	...	...	...	...	1	...	...	1	...	3
Rheumatic	4	5	2	...	...	...	...	...	...	...	...	...	11
Catarrhal	2	4	2	1	...	...	...	...	1	...	1	...	11
Nervous	...	1	1	2	...	...	1	...	...	...	...	...	5
Puerperal	...	...	...	1	...	...	...	...	...	1	...	...	2
Hectic	2	...	...	...	...	...	...	...	...	...	...	...	2
Yellow	...	...	...	1	...	34	586	1072	400	72	11	5	2181
All fevers	251	208	144	177	260	377	857	1257	642	449	357	284	5264
All diseases	1208	744	766	743	957	1002	1370	1643	1085	699	862	843	12192

Then, again, it will be seen that *nearly half* the cases admitted into the hospital this year were *fevers*, and of these, *nearly half* were *intermittent*. During the three months that yellow fever prevailed epidemically, there was one-fourth as many cases admitted of intermittent and remittent fevers.

These facts, I think, tend to show the intimate relationship between intermittent, remittent, and yellow fever, and more especially so when we see these different types intermingled or combined in the same subject, as we sometimes do. Thus, a person may be

attacked with intermittent and die with yellow fever, or be attacked with yellow fever, which will terminate as a plain intermittent. Dr. J. C. Nott, of Mobile, maintains that these fevers are entirely *distinct diseases*, originating from *different causes*. He admits that they may prevail at the same time and place, and even make a *simultaneous* attack on a person; but when this is the case, he says, the result is a "*hybrid disease*," partaking of the nature of both types, either of which may gain ascendence in the course of the attack. But to my mind, it is more rational to view them as *varieties* of disease, springing from a common remote cause, which may be modified by various attendant circumstances in the earth, air, and human constitution, and thus produce a corresponding variety of effects. I am sorry it is not in my power at present to discuss this question farther.

The total mortality for the year in New Orleans was 10,096, of which there died of yellow fever 2,598. The epidemic ran its course, and ceased long before the appearance of frost, though sporadic cases continued to appear until late in December, as usual.

The unquestionable *domestic* origin of this epidemic (no person pretending to trace it to a *foreign* source), together with the great expense and inconvenience of quarantine, caused the people to cry aloud for the repeal of the law at the next session of the Legislature, which met in January, 1856. A strong effort was made to accomplish this, but it failed, and quarantine is still enforced at the station on the river, 70 miles below the city. The original opponents of quarantine are unwilling to have the law repealed too soon, preferring, since so much money has been expended on the establishment, to have it kept up until all are convinced of its utter futility, at least as a protection against *yellow fever*. Perhaps when this result is brought about, the people may be willing to resort to more rational measures for getting clear of this pestilence.

PATHOLOGY AND TREATMENT OF YELLOW FEVER.

I know of no discovery made in the pathology of this disease in *this city* since my last report; but the January and April numbers of the *Medico-Chirurgical Review* contain a report on the yellow fever of Demarara, by Dr. Daniel Blair, Surgeon-General of British Guiana, which shows that some important discoveries have been made recently. I shall endeavor to test these discoveries as soon as opportunity offers.

In respect to *treatment*, I feel authorized to say, the general opinion of the profession in this region now is, that we have hitherto been giving too much medicine in yellow fever; in other words, we have been taking it out of the hands of *nature*, and trying too hard to *cure* it; whereas, all that seems necessary to be done is to assist nature in her conflict with the *febrific cause*. What this cause is we know not, but it is evidently something that seriously disturbs the most important vital functions of the system, and is very liable to cause death. In *fatal* cases, we generally observe *before death* an arrest or cessation of the functions performed by the great excretory or depurative organs, the *liver*, *kidneys*, and *skin*, also hemorrhages from various parts of the body, as the nose, gums, stomach, bowels, uterus, bladder, eyes, ears, scrotum, and any excoriated surface; likewise, serious disturbance of the brain and nervous system generally. *After* death, we find the *liver* generally of the color of ground mustard, frequently dry, though sometimes engorged with blood, and generally displaying but little or no bile in the *pori;* we find the *skin* nearly always yellow; we find the *stomach* most generally containing effused blood, commonly called *black vomit*, the mucous membrane thickened and softened, occasionally abraded or broken, sometimes red and engorged with blood, sometimes pale and anemic; we find similar appearances in the mucous membrane of the intestinal canal; we seldom find much alteration of the *kidneys;* we often find sanguineous engorgement of the *brain* and *spinal marrow*, with serous effusion under the arachnoid membrane; we sometimes find ecchymoses and gangrenous spots on the surface of the body and extremities; and we frequently find the *blood* of normal color, consistence, and coagulability, though the late researches of Dr. Blair demonstrate that very material alterations of the blood are often observed in the latter stages of yellow fever, and soon after death.

Now, supposing a *cadaver* presenting most or all of these appearances were laid before an educated pathologist, without giving him any history of the case, or any clue whatever to the place of its occurrence; would he be able therefrom to form a correct idea of the nature and symptoms attending the disease, or the length of time it had taken to cause the fatal result? I am inclined to think he would not; and if so, does it not admonish us that we may have been accustomed to attach too much importance to *post-mortem examinations*, and to hope for more benefit from them than we had any right to expect? In the dead body we see *not the disease*, but

merely its *effects—its ravages* on the human frame. Nor can we derive from this source alone, at least in the instance before us, any valuable suggestions in regard to its proper treatment, or the remedies that may be the most useful. We must study more carefully the nature of the disease *during life*, and the effect of remedies upon it. What remedy of generally admitted value, I would ask, have we been led to adopt by our discoveries in the dead-house? Not one, that I know of!

And now let us see what takes place in cases that progress *favorably and terminate in recovery.*

The attack is marked by more or less chilliness, very soon followed by burning fever, with flushed face, injected eyes, severe pain in the head, back and limbs, and frequently nausea and vomiting. The head and stomach symptoms, when violent, are readily relieved by local depletion, the patient is easily thrown into copious perspiration by means of the mustard foot-bath and a cup of warm tea, and the bowels are readily evacuated by purgative medicines. If the patient now remains quietly in bed and avoids every kind of imprudence, the fever will run through its natural course in about three days; the functions of the great excretory organs, skin, liver, and kidneys, will be performed without interruption, and usually, at the close of the third day of sickness the disease will come to a crisis and cease, leaving the patient very much prostrated.

As the critical stage approaches, we frequently observe more or less hemorrhage from the nose, gums, or uterus. This is but a short description of an ordinary mild case of yellow fever, one that calls for very little medical aid.

A majority of such cases would probably get well by the efforts of nature alone, if the patient would stay in bed four days covered with a blanket and drink some diaphoretic tea. But the picture will be quite different if the *onus* of disease should fall upon some particular part, or the function of any or all the excretory organs should be arrested. Then will arise a necessity for medical aid which must be promptly and skilfully applied, else death will be inevitable. But the question is, what constitutes the disease? or what actually takes place in the system when a person is attacked with yellow fever, passes through all its stages and recovers? This is a problem that has never yet been satisfactorily explained, yet we should not despair of accomplishing its solution at some time or other. Dr. Blair says, in the paper before alluded to, "that the test-tube and microscope are as necessary for the correct diagnosis

and prognosis of yellow fever, as the stethoscope and pleximeter for diseases of the chest." Yet the information to be obtained through these instruments is just beginning to be made known to the profession at large. I am convinced that with proper means for investigation we may expect to obtain a great deal more knowledge of the nature and treatment of yellow fever by examining the blood and secretions during the life of the patient, than from the body after death. But I am compelled for want of time to dismiss the further consideration of the subject at present.

The *very best treatment* for yellow fever is far from being agreed upon as yet; and the great diversity of practice that is pursued, indicates plainly that the disease is not yet well understood. As before remarked, the experience of the last two or three years, in this region, seems to have led to the adoption of a *milder* course of practice than was formerly pursued; but the fell destroyer still claims its host of victims, in spite of potent drug or magic skill. We have as yet discovered no *specific* for yellow fever, and are left to treat it on general principles, aided by the lights of experience. In 1854, the discovery of a grand *specific* was publicly announced to the world by two of the physicians of Savannah, Georgia, Drs. Wildman and Harris. This was the *muriated tincture of iron*, in doses of twenty to sixty drops every two hours. But, after a few short weeks of evanescent celebrity, its boldest advocate, Dr. Wildman, was swept off by the pestilence, and the remedy was soon consigned to the tomb of oblivion. I am by no means sure, however, that this stern decree was not both *precipitate* and *unjust*. From the highly laudatory accounts of the remedy that were published in the Savannah papers, and after being assured that the physicians who recommended it were respectable gentlemen, I was induced to give it a trial in our Charity Hospital. My first experiments were so satisfactory, that I not only continued its use there, but also in private practice, and with results much more satisfactory than I should have anticipated from the before-known action of the medicine, and the diseases and states of the system for which it had commonly been prescribed. The course I pursued was, first, to evacuate the bowels with castor oil, or some other mild purgative, and then commence with the tincture of iron, in doses of twenty drops, diluted with a little cold water, every two hours. Contrary to what I should have expected, the effect of the medicine was to gradually reduce the febrile excitement, and lessen the headache, to allay thirst, induce sleep, and cause a free secretion of urine. It sometimes constipated the

bowels, but this was easily obviated by mild purgatives. At other times it disagreed with the stomach, and had to be discontinued; but, for the most part, the effects of the remedy were entirely satisfactory, and I think it deserves a farther trial by the profession. Drs. Harris and Wildman were induced to resort to this medicine as a remedy for yellow fever, by witnessing its beneficial effects in erysipelas and scarlatina, supposing there was some analogy in the three diseases.

I will here close my remarks on the yellow fever of New Orleans during the last two years, regretting my inability, for want of leisure, to do anything like justice to the subject. I particularly regret not being able to discuss more fully the questions of the origin and infectiousness of the disease; but these questions are referred to in most of the contributions that are to follow, and the reader will have an opportunity to see what others think of them as well as myself. In the report of Dr. Barton, that comes next, will be found an investigation into the *atmospheric and terrene conditions*, accompanying the origin and prevalence of both yellow fever and cholera, which is well worthy of perusal. It is not my business to pass judgment on the value of Dr. Barton's laborious researches into the causation of epidemics. I hope the reader will examine them carefully, and award them the merit they deserve.

Epidemic Cholera.—This disease has prevailed in New Orleans, and at several places in the interior, on different occasions during both of the last two years, but is evidently gradually disappearing. At this present writing (June, 1856), we have quite a prevalence of diarrhœa, some few cases, when neglected, running into distinct *cholera*, with cramps, and rice-water stools. I think it is the last expiring effort of the grand epidemic that broke out here in December, 1848. We may now hope for a cessation of this epidemic during the next ten years.

APPENDIX.

I.—*Quarantine and yellow fever at Natchez during* 1853–'54 *and* '55: *the futility of the former and the local origin of the latter conclusively shown; and admitted for* 1855, *by the most strenuous advocates of the one, and the most ardent disbelievers of the other.* By C. H. STONE, M. D., of Natchez.[1]

To begin with the year 1855. Quarantine was established on the 19th July, and the station fixed four miles below the city. The health of the people continued good, with the exception to be stated; no deaths from disease having occurred for four or five weeks.

On the 4th September, the Board of Health published the following information for the people.

"TO THE BOARD OF HEALTH.

GENTLEMEN: I have the pleasure of reporting our city remarkably healthy; we have had no infectious diseases, and fewer cases of the bilious remittent and intermittent fevers than I have ever known. There is no sickness at the quarantine station; I think the indications are clear that we shall have a very healthy season.

Yours, respectfully,

L. P. BLACKBURN."

NATCHEZ, September 3d, 1855.

[1] This paper is taken from the *New Orleans Medical News and Hospital Gazette*, for Nov. 1855, and contains the substance of a communication to me which was intended for the report I expected to make last year. Dr. Stone is one of the most respectale physicians in the south, and his statements are entitled to all confidence. He demonstrates the *local origin* of yellow fever in Natchez as plainly as Dr. Barton and I have down in New Orleans; he also shows how little benefit has been derived from quarantine; but he omits to notice the spread of the disease in the country back of Natchez, within the last two or three years, so much like measles, scarlatina, and hooping-cough.

Dr. Stone's paper is a valuable one. E. D. F.

On the 6th September, the following card, dated the 5th, was published.

"The undersigned, practising physicians of Natchez, deem it their duty to state, that within a few weeks, several cases of yellow fever have occurred in this city; some of which have recovered, others have died, and at this time, there are other cases existing.

W. HARPER,
W. L. JONES,
C. H. STONE,
JNO. C. INGE,
H. LYLE."

On the 8th September, the Board of Health met, and the following was the result of their labors.

CITY HALL, September 8th, 1855.

"At a called meeting of the Board of Health, held this day at 3 o'clock, P. M.: Present, R. W. Wood, Esq., Mayor; Dr. L. P. Blackburn, Health Officer; Messrs. Burns and Doniphan:"

The following report of Dr. Blackburn was submitted, which, on motion of Mr. Doniphan, was adopted.

"TO THE BOARD OF HEALTH OF THE CITY OF NATCHEZ.

GENTLEMEN:—It becomes my painful duty to announce to you the existence of yellow fever in our city.

Yours respectfully,
L. P. BLACKBURN,
Health Officer."

The following preamble and resolution of Mr. Doniphan was, on motion of Dr. Blackburn, unanimously adopted:—

"The City Council, with commendable diligence, as soon as yellow fever was announced in New Orleans, established, and have continued to enforce rigidly, the quarantine laws against all boats and their passengers from infected ports, and have also had an armed guard on the roads leading to the city, as well as a secret police officer to detect infractions of the law, and have done everything in their power to keep Natchez free from exotic yellow fever; notwithstanding all which it is in our midst, and threatens to become epidemic:

"*Therefore Resolved*, That the yellow fever now existing among us, is a visitation of an all-wise Providence, against which the most

judicious human efforts have been unavailing, and while we deplore the fact, we feel it our duty to make it known to our citizens, that they may take such measures to avoid the infected atmosphere as they may deem advisable.

"*Resolved*, That the proceedings of this Board be published in handbill form, and posted on the streets, and also inserted in the papers on Tuesday. On motion, the Board then adjourned.

W. H. STEWARD,
Secretary of the Board of Health."

Now for the origin of this yellow fever:—

First Locality.—The first cases that came under my notice, were in the family of Mr. J. D. Shields—his wife, four children, and five servants, and the first no doubt in the city, as follows: August 17th, Bayard Shields, aged 6 years; 17th, Charles, servant, aged 8 years; 19th, Mary, servant, aged 11 years; 19th, Joe, servant, aged 50 years; 20th, Mrs. Shields; 20th, Dunbar Shields, aged 13 years; 21st, Barthena, servant, aged 14 years; 21st, Abijah Shields, aged 2 years; and on the 22d, Sye, servant, aged 25 years.

Before these cases occurred, I had once visited Wintz, a servant, 35 years, on the 8th August, then sick one or two days. She had had yellow fever in 1853, and I saw nothing peculiar in her attack this year. On the 12th August, Judy, 8 years, was taken sick, and on the 14th, Mary, 40 years, servant. I did not see these cases, but Mrs. Shields, who has had much experience in southern fevers, assures me that the attacks of Wintz and Mary were exactly like each other, and different from all the rest; and that Judy's was as much unlike these, as precisely similar to Bayard's and the others.

The reason for thus stating these three cases, will be apparent in the sequel. Up to the 15th October, these persons have remained free from diseases.

It is well to state here, that Mrs. Dr. Chamberlain, and Mrs. Gab. B. Shields, both living in the country, had attacks of yellow fever after visiting Mrs. Shields' residence; the former remaining there 36 hours, and the latter being there several times.

On the 22d August, a case occurred at Mr. J. Bradley's, adjoining Mr. Shields.

On the 23d August, Mr. Skinner, and on the 26th, Mr. Knickerbocker (both residing at Mr. Walworth's, also adjoining Mr. Shields), and on the 26th, Mr. Walworth's servant, Mark, had attacks. Mr.

Walworth's family were absent, and his servants, excepting Mark and one other, were protected persons.

The residences of Shields, Bradley, and Walworth, are on a high, dry, and clear ridge, one-third of a mile northeast from Main Street, or the centre of the city, and are the only ones on twenty or more acres of land.

Second Locality.—On the 19th August, occurred the case of Kennedy, an Irishman, laboring in a brick-yard, one third of a mile southwest from the city, and living in the Lancaster Row, on the second square southwest from the centre of the city, and one-third of a mile from the first locality. On the 25th, Kennedy's mother, living in the same house, was attacked.

Third Locality.—The first case under Dr. Harper was on the 20th August—Greeincher, near the Cotton-press, and near the river, and one mile north from the centre of the city, and half a mile north from the first locality.

Fourth Locality.—The first cases under Dr. Lyle, were on the 21st August—George, a young man, living with Crone and Swarty, on Main Street, in the centre of the city; on the 24th August, Mrs. Staniforth, living three squares east from Main Street, and centre of the city; on 27th August, Boas and his wife, living one square from Main Street, quarter of a mile southwest from centre of the city, and within two squares of Kennedy's, or the second locality, one-third of a mile from the first locality, also, a third of a mile from Mrs. Staniforth's, and one mile from the third locality.

No doubt, other cases occurred at or near these dates, and at other points of the city, I mention but one very probable one. It was called, before death, by Dr. Davis, "Typhus Stupidus," and was reported in the papers as dead on 31st August, of "Typhus"—"*Stupidus*" being left off, and *Icterodes* not being added.

The cases under Drs. Harper, Lyle, and myself had no communication with each other—with steamers or with goods, wares, or merchandise from infected districts, of which there was but one in the South at the time. But those at Mr. Shields', and the outbreak of the disease in the city, have been attributed by some to *one change of clothing* worn by Mr. S., while remaining forty-eight hours between the 30th July and 1st August, on the wharf-boat at the quarantine station, where, at that time and before, there had not been a single case of the disease!!!

Let me see. Wintz took the soiled clothing from Mr. Shields'

carpet bag, threw them in the sun, and they remained exposed in the open air all night.

Mary washed them the next day, August 2d. Wintz, who had had yellow fever in 1853 was *sick* on the 8th. Judy, who had not touched the clothes, on the 12th, and Mary on the 14th. If Wintz and Mary, or Mary only, alone received the yellow fever from these clothes from touching them, so did Judy without doing so, and Mr. Shields should have been the first case.

Whether Mr. Shields had any attack I am not disposed to assert or deny. He was suffering on the 21st and 22d August, in the manner that Dr. Lewis, of Mobile, describes as sometimes happening, and very much as Mr. Elliot, whose case is to be mentioned as one of Mr. Pearsall's attendants, and moreover, he has remained free from attack to the present writing, 15th October. If Wintz had a second attack, Mary, far more probably, had a first one. If Wintz and Mary had yellow fever, Judy, most certainly, had the same, which fixes the dates of the first cases, on the 6th or 7th of August for Wintz—on 12th for Judy; and on the 14th for Mary. But it is of small moment about these cases and dates.

The disease was in Mr. Shields' family most clearly on the 17th August, and the question is, was the poison or contagion of yellow fever conveyed to his house in a *two foot* carpet bag, containing one change of soiled clothes, and a few clean ones; and again, how did this virulent contagion get into the carpet bag? As many people believe in this power of yellow fever contagion, now that their fear of the disease has been wrought to such tension, I propose to show that the thing is simply impossible. The evidence given must dispel any such idea from the minds of all, here or elsewhere.

The yellow fever was *said* to have been introduced into the Island of Boâ Vista, one of the Cape de Verdes, by the British Steamship Eclair in 1845. Dr. McWilliam was directed to inquire into it, and in his report makes the following statement: *Twelve bags* of soiled clothing were landed on the 21st August, and distributed to seventeen washerwomen on the next day. The testimony respecting the periods of attack of thirteen of them, was taken in April 1846, four having died, but of what disease or when taken sick, nothing is said. The names are omitted here, though given in the report.

No. 1. Had fever late in December.

No. 2. Had fever late in January.

No. 3. Was sick after No. 1.

No. 4. Had fever in January, her mother, father, and two brothers were taken first.

No. 5. Not sick until lately (near April, 1846).

No. 6. Never had fever.

No. 7. Taken about 20th October.

No. 8. Does not know the exact time, but not till Mary had died.

No. 9. Had not the fever until after her husband, who was attacked after the fever became general.

No. 10. Never had the fever.

No. 11. Had fever about the same time with the rest of the family.

No. 12. Had fever after her brother, who died some time in November.

No. 13. Was never attacked till January.

If such be the result, actually *nothing*, from washing, what may be reasonably calculated for seventeen women at a thousand, not to say one thousand seven hundred pieces, and these, from a ship in the tropics reeking with *African* yellow fever; how much *New Orleans* yellow fever ought to have been carried into the city of Natchez by *one change* in a two foot carpet bag, which remained two days on a wharf-boat at the Natchez quarantine station, where there had not been one case of that disease? Certainly, *less* than *none!* But, perhaps, by certain shakes, up, down, horizontal, the potency of nothing was exalted to the thirtieth degree, and the spiritualized attenuation received in infinitesimal doses sufficed to do the deed. An example of *much* from *nothing*, in which some people are found to believe. I hope my friend Mr. Shields, will in future shake his bag less potently, or perhaps better reverse his shakes.

1853. It has been said that the epidemic of 1853 was owing to the introduction of the case of Mr. Pearsall, who came from New Orleans ill of the disease, and died at the Mansion House, on the 17th July.

Dr. Blackburn and Dr. Davis make this statement, and I offer the following proof that it is not true; nor is it true that Murray, who came home on the day of quarantine being established, ill of the disease, and died on the 26th July, caused the epidemic.

The first cases of that year, were as follows:—

The *first* on the 14th July, a foreigner, who arrived in New Orleans on the 13th or 14th of June, where he remained four or five days, and reached this place on the 20th. He either contracted

the disease here, or his case shows a period of incubation of twenty-six days.

The *second* on the 15th; *third* on 26th; *fourth* on 25th; *fifth* on 27th; *sixth*, Larry Curtiss, on 31st July or 1st August, a barkeeper in Mansion House, and one of Pearsall's visitors; the *seventh* on 2d August, whose arrival, stay and departure from New Orleans, and arrival here, were the same as the first case. The periods of incubation for her, will be forty-three days, or she received the disease here.

These cases, except the *first* and *seventh*, were far removed from each other, and all except Curtiss, were on different squares from the Mansion House.

A man, I believe a barkeeper, died at the Mansion on the 2d of August, from falling over the banisters while in delirium from drink.

Dr. Lyle states, that his first case was on the 16th July, and from the 17th, "almost every case assumed that form."

I give the following account of the attendants and visitors of Mr. Pearsall, which I have every reason to believe constitutes the whole truth.

Mr. Hugh Elliot was more constantly with him than any other person, Gus excepted. About the middle of August (about twenty-eight days from the 17th July), Mr. E. was confined to his bed for four or five hours, felt badly for three or four days after, and has had no other sickness since, though exposed during the remainder of that and to the 15th October of this year. The disease was very generally prevailing before his attack.

Gus belongs to Capt. Knight, who says that he has never had yellow fever.

There were two barbers to shave him, but of these I can learn nothing, as they are not in the city.

Mr. J. R. Mitchell did not have yellow fever till 1854, and then in New Orleans.

Larry Curtiss, who Mr. Elliot shows was in the room at the sealing of the coffin, but does not remember to have been there at other times, was attacked on July 31st or August 1st.

Dr. L. P. Blackburn was his attending physician, and does not admit that he has ever had yellow fever.

I have been unable to learn that other persons were in his room, except Dr. Lyle.

If the preceding evidence be not sufficient to show that Pearsall's

case had no agency in the production of the epidemic, of which cases began *before* his, I am thrown under the necessity of denying almost that we had any epidemic at all; certainly not till thirty or forty days after his death, and then to have begun in the usual mode: cases here and there become more and more numerous till prevailing generally. This has usually taken several weeks, and would carry us into the middle or last week of October. At this date, the epidemic of 1855 is nearly at an end, perhaps only for want of subjects. And I prove this position in this wise. After the announcement by the city authorities as advised by me, then health officer, that an epidemic was impending over us (for which I was bitterly abused for a week), Dr. Blackburn for about two weeks, and Dr. Davis for three or four days, denied that there was any yellow fever in the city; forty days (quarantine number), at least having elapsed since Pearsall's case according to the former, and thirty or more days according to the latter authority, and no disease resulting till the middle of October—that is, provided these two authorities were not mistaken in 1853, as they were in 1848 and in 1855. I think it more than the people care to believe, or have bargained for, that one or two cases can cause an epidemic thirty or forty days after introduction. This is like running ahead of the fox.

In 1854, Dr. Blackburn being health officer, quarantine was established on the 25th August, long after yellow fever was known to exist in New Orleans. It was discontinued on the 21st October, while the disease was still in New Orleans, and goods in that city of necessity more imbued with the poison or contagion, and while he disease was known to be in Vicksburg in an increasing degree, and springing up in various parts of the South.

This statement shows the supreme absurdity of that quarantine.

Cases of yellow fever occurred in my practice between the 12th and 26th August, and between the 9th and 15th October. Dr. Lyle had cases under his care, and Dr. C. L. Smith had one case. These, in all, about fifteen, were of *local* origin. Dr. Holcombe may have contracted the disease in Natchez, or at Lambdin's, six miles below the city, in Louisiana, where it was said that yellow fever prevailed, but denied by some, for the very insufficient reason of its mildness.

That his case was yellow fever, was the opinion of Drs. Lyle, Davis, Fortu, and the writer. It was called dengue by one physician, and all were denied by Dr. Blackburn to be yellow fever.

Besides these cases, one was introduced which calls for all the attention of the people. It is the case of Mr. Poque, a Kentucky trader, who contracted the disease, most probably elsewhere, and was treated by Dr. Blackburn in this city. That Poque had yellow fever, is susceptible of full proof.

If Pearsall's case gave an epidemic in 1853, why did not Poque's in 1854?

I have a few words to say respecting errors promulgated with great zeal, about the disease and quarantine during years preceding these three. Judge Dubuisson, July, 1845, teaches the Mayor and Selectmen, and the pupils of the Institute, that "the quarantine has been imposed seven times, to wit: in 1841, 1842, 1843, 1847, 1848, 1853, and 1854, with *complete success*, except in 1853."

Drs. Cartwright, McPheeters, Lyle, Jones, Cochran, and Thistle, authorized me to publish in the *New Orleans Medical and Surgical Journal* for 1848, that several cases of yellow fever occurred here during 1847.

There were at least fifty or sixty cases, and among them some of the most intense I have ever seen.

Perhaps those physicians knew more about yellow fever than Judge Dubuisson, though perhaps the Judge does not think so.

Respecting 1848, Judge Dubuisson and other medical men, and Drs. Blackburn and Davis, denied that the epidemic of that year was yellow fever. They called it dengue. Yet Judge D. admitted to me, in 1854, that he had an attack of yellow fever that year in the city. Dr. Blackburn, also, had an attack of yellow fever that year. He was attending Mr. Van Horen, who had black vomit within a few hours after. Dr. Jones and I became his physicians, which took place because Dr. Blackburn was attacked at this time. It was this *attack of yellow fever* that gave Dr. Blackburn his protection against the contagion of Pearsall's case, and against the "morbid miasm" from the "three" who died, and the "four" who "recovered at the quarantine station" in 1854, and against the "morbid miasms" of the hundreds he has attended since 1848, and against the poison of yellow fever, generated in the city of Natchez several times since. Few people now deny that the so-called dengué of 1848 was yellow fever. There were about forty deaths, with hemorrhages, etc.

Within ten years we have had three epidemics, and during two years only, we have not had some cases according to my observation.

Dr. Lyle has been here twenty years, and says that during that time, he has seldom failed to see some cases every year.

Cases of yellow fever occurred in 1854, as in 1848, and in 1853, and perhaps in other years before quarantine was established. Therefore, it is neither to the discredit nor credit of quarantine, that epidemics have or have not happened during those years. But this was not the case in 1855. Fortunately, the quarantine was established (and was rigidly enforced throughout) several weeks before any case of this disease took place—nearly fifty days up to the time when the Board of Health, as advised by Dr. B., admitted that yellow fever existed in the city.

The explanation given of all this, and the reason why Poque did not cause an epidemic in 1854 is, "that an all-wise Providence did not intend us to have an epidemic that year, but did intend it in 1853 as in 1855." An all-wise Providence no more regards quarantines against the indigenous, domestic, local, in a word, against the endemic diseases of a country, than other vain efforts of vain and self sufficient man. The Board of Health deserves much credit for the graceful and prompt manner in which they admit that in the contest waged with Providence, they have been conquered; and more for the admission, so forcibly implied, that in 1854 there could have been no contest with Providence—in other words, that "Providence did not intend an epidemic that year"—only fifteen or sixteen cases of *local* origin, and one or two imported—otherwise, the Board of Health would have come out of the contest, then as now, second best—a conclusion which the Board will admit, no doubt.

Yellow fever is going through one of its grand cycles of increase in violence and of extent of territory invaded. It is to be feared that we have not seen the end of it yet. The disease has already appeared in Baltimore in 1853 and 1854 (there also in 1849); in Philadelphia in 1853; in St. Louis in 1854; in Norfolk, Portsmouth, Gosport and Memphis in 1855. It will soon be showu that it was of *land* origin in Gosport, as in all the other places named.

Another cycle began in 1791–3, prevailing more extensively than usual in the West Indies and Spain, and for many years, through the Northern Atlantic States. Its local origin was well shown in six different places during the embargo, and over and over again when quarantines were established.

Another cycle again may be stated in 1817–22, during which time, the disease appeared in a great many places, as Philadelphia,

New York, and at Natchez for the first time, epidemically at least, and in numerous other places in the United States.

This periodical increase of the disease in extent of country it invades, is the explanation of its *communicability* by persons, goods, carpet bags, etc., so apparent to many, and yet so unreal.

The poison of yellow fever may be put up or generated in the *holds* of ships, and thus it may be, and often has been transported from port to port, or comes from the open ocean into healthy ports, giving the disease to those who go on board, or *near* the ship after opening the hatches. Infected ships have long since been known to be "floating places of infection." Let them be quarantined, and avoided by the unprotected. Let river steamers go with wind sails and open hatches, and then fear not to enter the hold, even if they started full of an infected atmosphere. It cannot remain against a ten knot breeze.

Thus far, quarantine and no further—for belief in all else is unfounded—mere *post hoc* conclusions, and leads to panics, inhumanity, and back to ages of barbarism, and sadly increases the mortality from the disease.

II.—*On the Yellow Fever of Woodville, and its vicinity, in the State of Mississippi.* By ALFRED C. HOLT, M. D.

[The letter of Dr. A. C. Holt, on the yellow fever of Woodville, Mississippi, and the region around, shows the author to be a man of accurate observation and reflection. He stands deservedly high as a practitioner, and does an extensive business. He here gives us a valuable collection of facts relative to the *origin and extension* of yellow fever, and declares his conviction that *under favorable circumstances*, this disease may be transported from one place to another, regenerate itself, like scarlatina and measles, and be communicated from person to person. For myself, I am free to confess that the facts presented by Dr. Holt, together with many others of the same kind that have come to my knowledge within the last three years, in this region, appear to me strongly to support this position. In maintaining the opinion that yellow fever is transportable and communicable under *favorable circumstances*, Dr. Holt says: "It does not follow that it may not be of *domestic origin* whenever causes exist favorable to its production." This is a point of equal, if not greater importance than the infectiousness of the disease; for we may possibly discover the means of *preventing* the production of yellow fever, but if the disease be transportable and communicable, the

only hope of confining it within bounds must rest on *the complete cessation of all intercommunication during the season of its prevalence.*

Fortunately for mankind, this is not a *common*, but an *extraordinary* feature of the disease, which but rarely occurs. Why it should present itself only in some seasons and localities, and *not always*, forms an interesting problem, as I have before remarked. It will be seen that two others of my correspondents, Drs. Wood and Stone, present some strong proofs of the *local origin and non-contagiousness* of yellow fever.

Dr. Holt points out what he considers to be well marked distinguishing features between yellow fever and *dengue*. He looks upon them as "distinct diseases," yet he says there is "a striking resemblance between them," and even admits that "they probably originate from similar causes, but there is wanting some ingredient to make them *identical*." In support of his position, he refers to the analogy afforded by chemical *isomerism*, where the same elements, combined in the same proportions, produce substances *altogether different*. This is the very analogy reverted to by me about nine years ago in support of the *opposite* conclusion. I do not contend that bilious fever, dengue and yellow fever are *identically* the same, but that they are varieties of disease springing from the same elements differently combined and modified by attending circumstances. They all prevail at the same time and place, and their *diagnosis* has puzzled the most accurate observers. One thing is certain—that whenever dengue prevails epidemically, the few fever cases that terminate *fatally* always present the commonly admitted signs and appearances of yellow fever, such as black vomit, yellowness, etc. In this assertion I have been fully supported by Dr. C. H. Stone, of Natchez, and Dr. G. A. Ketchum, of Mobile.—E. D. F.]

Woodville, March 6th, 1856.

Dr. E. D. Fenner—

Dear Sir: At your request, I give you a brief account of yellow fever, as it prevailed in this region during the last two or three years, and particularly as to "the facts tending to throw light upon the question of its origin, whether foreign or domestic."

The first case of which we have knowledge in 1853, occurred at the Woodville Factory, which is situated about a mile south of Woodville, in a beach grove and in a locality considered healthy.

This case was a man named Lee, who had been one of the factory operatives. He left the factory late in July, and visited New

Orleans; returning directly thence, he reached the factory on Wednesday, the 9th August, and died with black vomit the following Sunday night.

Though he had a chill soon after his arrival at the factory, Wednesday evening, yet he left his bed the next morning and walked into Woodville, where he remained several hours.

On the 25th of August, the next case occurred at the factory; on the 28th, 29th and 30th, several others were attacked, and during the first week of September, the disease became general among the factory hands. I could trace no chain from case to case—nearly all of them had been in deceased's room during his illness, and at the time of his death.

As a rule, the attacks did not set in with violence—those in which this was the case, generally yielded readily to treatment, while many of the most formidable cases I encountered commenced with seeming mildness, and were attended throughout with little suffering. The deaths ordinarily occurred on the fifth and seventh days; in fatal cases, delirium, hemorrhages, jaundice and black vomit were common.

On the 26th of August, Alfred, a boy belonging to Dr. Henderson, was taken; on the 31st Dr. H. was attacked, and during the next ten days his whole household, numbering nine persons, passed through attacks. On the — of August, Major Feltus was taken ill. His attack, at the time, was not considered yellow fever, but subsequent events satisfied his physician, Dr. Angell, that it was so. As soon as he was able to be removed, he was taken to the country with his family, where one of his children had an attack soon after. In the cases of Maj. F. and Dr. H.'s boy Alfred, there had been no communication with the factory. Dr. H. had been in attendance on some of the earliest cases at that place.

The residences of both these gentlemen are on the southern boundary of Woodville, and therefore nearest the factory.

On the 7th of September, I visited two children at Mr. Noble's, about two hundred and fifty yards north of Dr. H.'s. These proved to be cases of yellow fever, and I am satisfied had had no communication with any other cases. From this time until the 21st, occasional cases occurred having no traceable connection with each other, at which date cases were numerous, and in various parts of the village. When the first death after Lee's occurred at the factory, many of the citizens of Woodville becoming alarmed, left town, leaving something over two hundred unacclimated subjects,

not more than six or eight of whom escaped attacks. As many instances in which the fever occurred in families in the surrounding country contain points of interest, I will detail a few, and in order to explain fully the origin of the disease in the family of Mrs. McCausland, I give you some extracts from a letter of Mr. J. Scott Smith, of West Feliciana, written while the events were all fresh in his memory. The letter reads as follows:—

"Early in September, '53, my nephew, William McDermott, a youth about eighteen years old, arrived at my mother's house from Arkansas, having landed on his way down at Vicksburg, where he spent one night, the yellow fever prevailing at that place at the time.

"He came thence to Bayou Sara on a boat on which there had been cases, and some deaths from yellow fever—remained one night in Bayou Sara, the yellow fever prevailing there also, and the next day reached our house, ten miles in the country, with fever on him. He died five days after, throwing up a large quantity of black vomit before death ensued.

"In a few days Miss W., an inmate of the family, was taken sick, and about the third day of her illness Mrs. McCausland visited my mother, and was in Miss W.'s room two or three times during the day."

Mr. S.'s letter, in continuation, describes the cases of several other members of his mother's family, and the death of his brother Mr. P. C. Smith, with black vomit—all having been exposed to the case of young McDermott, and having had no other exposure. The cases occurred in rapid succession, and were all pronounced by the attending physicians to be yellow fever. Mrs. McCausland, who resided nine miles from Woodville, visited (as is stated by Mr. S.) his mother's during the illness of Miss W., "and was in her room two or three times during the day."

This visit was on the 20th of September; on the 26th Mrs. McC. sickened and subsequently died. On the 1st of October, owing to the prevalence of the epidemic in Woodville at the time, I did not see her, though her usual medical attendant—one of the gentlemen who attended her—pronounced her case to be yellow fever, and sent me for examination a vial of fluid ejected from her stomach previous to death, which was unquestionably black vomit.

Twenty days after the death of Mrs. McC., I was called to attend her daughter, Miss Eliza, who died on the tenth day after a well marked attack of yellow fever. During the progress of her case,

three servants who had aided in nursing her mother, were taken—on the day of her death, her brother Marcus was attacked—the day following, her sister, Mrs. Chinn, and a few days after Mrs. Stanton (who had assisted in nursing Mrs. McC. and Miss E.) had a well marked attack.

During the same fall, yellow fever made its appearance on the plantation of Mr. McCaleb, in West Feliciana Parish. As this place adjoined one owned by myself, I was, of course, particularly interested, and thus became fully informed of the facts. Dr. Wm. Stockbridge, who boarded in the family of Mr. McCaleb, was induced to go into Bayou Sara during the prevalence of the epidemic in order to render his aid to the physicians of that place, several of whom were prostrated at the time. Soon after his return to Mr. McC.'s he sickened, and in a few days was numbered with the dead, thus falling a victim to the generous impulses of a heart which had been ever prompt to respond to the calls of the sufferers.

In quick succession, nearly all the members of Mr. McC.'s family, white and black, were attacked, himself and two of his children soon following Dr. S. to the grave. In my quarter, which was not over half a mile from Mr. McC.'s residence, no cases occurred, nor were there any elsewhere in the neighborhood.

Dr. J. W. Davis, who resided nine miles from Woodville, visited a family near Fort Adams, in which there has been several deaths from yellow fever, and during the illness of one of its members. Two or three weeks after, he died with black vomit. It cannot be ascertained that he was exposed to yellow fever except during this visit.

Dr. B. Baldwin visited Dr. Davis several times in the latter days of his illness, and, twenty-two days after his death, sickened and died in five days with black vomit. Dr. Baldwin had been in attendance on Mrs. McCausland six weeks previous to his attack—this and the case of Dr. Davis were his only exposures.

Yellow fever prevailed in 1853 in many other families in the adjacent country, but I have confined myself to those instances in which little or no doubt existed as to the first exposure.

In 1854 we had no yellow fever in Woodville, or the surrounding country. I treated ten or twelve cases of dengue during the fall.

I am aware that many gentlemen whose observation and experience entitle their opinions to respect, entertain the view that yellow fever and dengue are so closely allied as to be one and the same;

and while it must be admitted that the resemblance is very striking, my own observation leads me to the conclusion, that they are distinct diseases—originating probably from similar causes, yet wanting in some ingredient to render them identical; and when we call to mind the isomeric theory in chemistry, and the fact that under this law the same elements in the same proportions even, produce entirely different results, it is not difficult to believe that a similar law may prevail in the causes originating diseases.

The assertion that dengue is a mild form of yellow fever, it is clear to me, cannot be true—for, during an epidemic in Woodville in 1850, in which nearly every soul suffered an attack, and from which not a death occurred, there were a larger proportion of apparently very severe cases, than would be presented in the same number of yellow fever cases. I can in my own person bear witness that there is nothing mild in an attack of dengue, either in the actual suffering and distress, or the condition in which the system is left by an attack. If asked to state the difference between the two in symptoms, I would say that in dengue the pains are more severe, longer continued, and more erratic; the rigors continue longer, often lasting for two or three days when the covering is moved; while in yellow fever they rarely continue over an hour or two; the occurrence of an eruption in the majority of cases of dengue resembling measles, and often that of urticaria; the painfully disagreeable visions and illusions which haunt the mind in dengue, often even in waking moments, and invariably in slumber; the injurious and sometimes fatal results of what are called "imprudences" in yellow fever—the harmlessness of the same acts in dengue; and in cases of severity, the greater tardiness in dengue in an entire return to healthful feeling. The *debility* is as great in the one as the other—probably in yellow fever oftentimes greater—but when the convalescent who has "got well through" an attack of yellow fever is once upon his feet, as a rule, his sensations are all joyous; he feels as if he had a new lease of life, and this not merely from a sense of danger escaped—while one just out of a severe attack of dengue, if asked how he feels, the most usual and very expressive reply is, "I feel *mean*," he rarely enjoys those delightful emotions which an entire return to healthful feeling can alone impart, but for days, and weeks, and sometimes months, he *feels* "mean." In dengue there is also a marked perversion of the sense of taste—nothing is natural, and the patient, in early convalescence, will turn with loathing from the idea of eating the most delicate

dishes. While it is undeniably true that rare cases of a second attack of yellow fever do occur, I am persuaded their apparent frequency arises from the fact that dengue is often called yellow fever, and *vice versa*. The mistake is an excusable one, in view of the many points of resemblance between the two diseases. During the epidemic yellow fever through which we have just passed, I treated seven cases which I pronounced dengue, though nurses and patients were disposed to call them all yellow fever.

In September, 1855, yellow fever again made its appearance in Woodville. The circumstances attending its commencement and progress are as follows:—

John Blacker, from Cincinnati, reached Woodville on the 15th August, having landed on his way down to Vicksburg, where he remained a few days. As yellow fever then prevailed at that place, and Woodville was under quarantine regulations, he was sent, on the 27th, to Hastings House, a temporary station one mile and a half southwest of Woodville, at which place he died with yellow fever on the 2d September. It is believed the disease had developed itself before he left town, as he had a chill on the evening of the 26th. On the 28th, Mrs. Blacker and daughter, Mrs. Craige and children, and Mrs. Brown, all residents of Woodville, and friends and relatives of Blacker, visited him at Hastings. On the 5th September, Mrs. Craige was taken sick, her attack being very slight. She was not visited by any physician, and we have only the opinion of her neighbors, who were familiar with yellow fever, and who pronounced hers a case of this disease. On the morning of the 6th, I was called to see Miss Woodbridge. On the night of the 6th, a negress of Bengoner's had a slight chill followed by a fever of five or six days' duration. This was her own statement to me when called to prescribe for her on the 12th. She ejected black vomit the next morning and died on the 14th.

On the morning of the 7th I prescribed for Wm. Beach, in the same house with Miss Woodbridge; on the morning of the 8th for Mrs. Blacker and her daughter, both of whom were taken during the night of the 7th; on the 9th for two children of Mrs. Craige; on the 11th for Anderson, a negro boy at Mr. Butterworth's; on the 13th for Mrs. Brown; on the 18th for Henry Blacker, and on the 21st the disease was declared epidemic.

All the above mentioned cases (Mrs. Brown, H. Blacker, Bengoner's negress, and the boy Anderson excepted), were slight attacks, and in consequence of the short duration of the febrile action,

I could not pronounce them at the time cases of yellow fever; but all doubts in relation to the majority of them were removed by subsequent symptoms during and after convalescence.

I have not been able to discover that Miss W., Wm. Beach, Bengoner's negress, or Anderson, had any communication with John Blacker, unless the fact that they resided upon the street along which Blacker passed on his way to Hastings', can be deemed such.

Blacker and Craige reside in the northeastern portion of the village, Butterworth in the southwestern, about half a mile apart. Mr. Beach's and Bengoner's houses are on an air line between the two—are one-third the distance from Blacker's to Butterworth's; Hastings is half a mile beyond Butterworth's, on the same road. Mrs. H. D. Smith's plantation is one mile beyond Hastings, and two miles and a half southwest of Woodville. About the 1st September, Jacob, a negro on Mrs. Smith's plantation, was taken sick. His attack being slight he had no physician, though it excited no suspicion as to the nature of it. On the 16th or 17th I was sent for to prescribe for Hannah, the wife of Jacob. On the following day I found twelve or fifteen additional cases in the hospital, which, after careful examination, I pronounced yellow fever. The first cases after Jacob, were members of his family. In the next twenty-four hours I had sixty cases under treatment, and the disease ran rapidly through the family, white and black. Jacob was, without doubt, the first case on the place. He had been passing frequently back and forth near Hastings, during the illness of John Blacker, and a few days before his illness opened a bale of India bagging just from New Orleans. This was his only known exposure to yellow fever, if such it may be called.

On the 26th August I was called up before day by Mr. Wall, returning from Cooper's Well, on board the steamer Princess, and found him to be in what proved to be the chill of a yellow fever attack. We landed in a few hours at Tunica, and he was conveyed to his father-in-law's, Mr. F. A. Evans, fourteen miles from the river, where he had a severe attack of nine days' duration. Upon reaching Mr. E.'s I sent for acclimated nurses to aid me, notwithstanding which precaution, in the succeeding ten days or two weeks after Mr. W.'s recovery, fourteen negroes, constituting all the household servants, stable-boys and hostlers, were attacked, and some three weeks after the last case in the yard, the disease developed itself in the quarter, which is half a mile from the residence. The plantation of Mr. Evans is in a healthy locality, isolated

by fields and forests, and in a region where yellow fever never before prevailed.

A few weeks after Mr. Wall's recovery, he visited the plantation occupied jointly by himself and his nephew, Mr. Williams, near Fort Adams, accompanied by Mrs. W. and her servant, who had also recently recovered from yellow fever.

Six days after their arrival, the woman in whose room the servant of Mrs. W. had been lodged, was taken ill, and on the third day of her attack Mr. W. communicated his suspicions to Mr. Williams, that it was a case of yellow fever. Mr. Williams immediately left the place and proceeded to Dr. Sheppard's, in Pinckneyville, was taken ill the following night, and had a well-marked attack of yellow fever. Before he was up from his bed, two servants of Dr. S. were attacked. Dr. S. and his wife had both had the yellow fever in 1853. In the mean time Mr. Wall had separated the negroes on the plantation, selecting some five or six who were known to have been in the room with the first case, and keeping them apart from the others, and in this manner the progress of the disease was arrested.

It seems to me a fair inference that if the fever had originated on the place, this separation would have been of no avail—but Mr. W. was able to designate which would be liable, and the result proved the correctness of his action.

Your question: "Do you believe yellow fever transportable and communicable? and if so, give the grounds of your belief," is sufficiently answered in the foregoing sketch. Except upon the hypothesis that yellow fever can re-create itself, under favorable circumstances, I see no satisfactory explanation for the cases I have quoted, and going over the whole country during the last three years, such instances might be added almost *ad infinitum*.

It is no argument against this belief to state the fact, that the disease does not invariably spread from an imported case. We all know and admit this to be true—and we also know it to be true, that a well-marked case of scarlatina can occur in a family, and not another case follow, or that every member of a household may pass through this disease, and none others in the immediate neighborhood suffer. And yet, no one will deny scarlatina to be highly contagious and infectious. The first case in Woodville, in 1854, was Mr. Thurber, a gentleman just from Galveston, where yellow fever was prevailing, who fell sick soon after his arrival at Wood-

ville; and the next cases were in the family in which he was sick, and in the families in the immediate vicinity.

The first case in our section, in 1853, was Lee, direct from New Orleans to the factory, and his companions and nurses were the next to suffer.

The first case in 1855, was John Blacker, direct to Woodville from Vicksburg, where yellow fever was prevailing, and among the first after his case were those who were known to have visited him after his inception of the disease.

If these are but accidental coincidences, they certainly occurred with a strange degree of regularity; not more, however, than that which has marked the progress of yellow fever along the course of commerce and travel.

In holding the opinion that this disease is transportable and communicable, it does not follow that it may not be *of domestic origin*, whenever causes exist favorable to its production. Acknowledging my entire ignorance as to them, I will not trouble you with idle speculations.

Respectfully,

A. C. HOLT.

III.—*Yellow Fever in the Country: An Account of the Disease as it prevailed at Judge Baker's Plantation, Parish of St. Mary, Louisiana, in September and October*, 1854. By C. R. FASSITT, M.D.

The plantation of Judge Baker is situated nine miles below Franklin, on the bayou Têche. His residence is on the west side of the bayou, which here runs north and south. The negro quarters are below the residence, the nearest being a hundred yards, and the farthest about three hundred and fifty yards distant. The bayou is a hundred yards wide, and its shores connected by a bridge. On the east side, there is also a row of cabins, situated some sixty or seventy yards from the bayou, extending some two hundred yards. Opposite the upper part of this row of cabins, is a railroad for hauling out vessels.

There were about one hundred and ninety negroes on this plantation, one hundred and thirty of whom had yellow fever. Six died, of whom two had black vomit, one a mulatto, and the other a black negro boy, aged about 10 years. One other was said to have vomited black matter, but I did not see the matter ejected.

This plantation is not usually more sickly than others in the

neighborhood. The negro houses have plank floors, and are as comfortable as such houses usually are found.

There had been no disease prevailing to any extent before the appearance of the fever in September. The houses are so situated as to form quite a town, and the streets, during the whole of the month of September, were in a most wretched condition, being a foot deep in mud.

The origin of this fever is the only matter of special interest connected with its history.

The barque Tivoli sailed from New Orleans towards the last of August, and reached Last Island, where, on account of sickness on board, she came to anchor, and there remained until the 5th of September. Two men died of fever on board, and the captain was brought to Centreville, having had fever also. He was very yellow and much debilitated, and one of the physicians who saw him, told me that he considered his disease yellow fever.

On the 5th of September, the Tivoli was towed in from Last Island by Judge Baker's steamboat Picayune, and left at his plantation. Here, at the railroad, on the east side of the Têche, she was overhauled and cleansed while within a hundred yards of half a dozen negro cabins.

The hands of the Picayune (all of them negroes and mulattoes), were the first who were attacked with fever. They had been on board of the barque, and had cleansed and smoked her hold, and were taken sick within ten days after.

I did not see them until the 26th September. I was then told that all of the hands of the Picayune had been sick, but were recovering slowly; for although they had no fever for several days, they were very much debilitated.

One mulatto, who had had but little fever, complained very much of prostration, and I found his pulse at forty-five per minute. Another man, also a steamboat hand, had slight bleeding from the gums. There were many new cases at this time, in all, some twenty negroes were "laid up with fever." The number of cases steadily increased until the 20th of October, when about fifty negroes were in the cabins. The first death occurred on the 4th October, and the last on the 17th November.

On the 17th October, two cases occurred in white subjects. Mr. Anthony Baker and his cousin were both attacked on that day. The former had black vomit in two and a half days from the onset of the disease, and died on the fourth day.

The latter died on the ninth day, having had hemorrhage from the nose and gums, and black vomit. There were seven cases of fever among white subjects, and four deaths.

The negroes for the most part were not seriously affected by the disease; many had the fever only twenty-four hours, but in every instance, greater prostration was observed than is usual in other fevers.

The negroes in the cabins near where the Tivoli lay, were first attacked by the disease, and I did not see a single case in which the subject had not been on the east side of the bayou.

I do not believe that yellow fever is *contagious;* that is, that one person having the disease can under ordinary circumstances communicate it to another. But, here the cause of the fever, whatever it may have been, was evidently in the vessel, and was communicated not only to those who cleansed the hold, but also to all persons in the vicinity. The cause remained after the vessel had left, and evidently increased in intensity.

Another reason why the disease became more fatal among negroes was the fact that, owing to the great number sick at one time, it was impossible to have them all well attended.

C. R. FASSITT, M.D.

I have it in my power to furnish the following additional facts relative to the barque Tivoli, obtained from a reliable source:—

The Tivoli took a cargo from New York to Chagres. After discharging there, she sailed for Berwick's Bay, on the coast of Louisiana, for the purpose of getting a cargo of molasses to take back to New York. After leaving Chagres, sickness broke out on board, supposed to be what is called "*Chagres fever*," a severe bilious remittent, and the distress was so great, that the vessel had to be taken to New Orleans. She arrived here in the midst of the epidemic yellow fever. A new crew was obtained, and she again put out for the bayous emptying into Berwick's Bay. It is presumed this new crew consisted of unacclimated men, and the vessel had hardly cleared the mouth of the river before yellow fever broke out on board, and prevailed to such an extent, that she had to be left to the mercy of the waves. She was cast on Last Island, from which she was taken by Judge Baker's hands. What occurred afterwards is graphically detailed by Dr. Fassitt.—E. D. F.

IV.—*Yellow Fever in the Country: An Account of the Disease as it prevailed on the Coast below New Orleans, in* 1854 *and* '55. By D. R. Fox, M. D.

DR. FENNER:—

DEAR SIR: In compliance with my promise, I will endeavor to give you an account of the yellow fever as it has occurred in this parish; but before doing so, I think it proper to give a general description of the parish, its inhabitants, and its most prevalent diseases. This parish comprises all that narrow strip of land bordering the Mississippi River on both sides, extending from within twenty miles of the city of New Orleans, to the mouths of said river, being about eighty miles in length, and averaging six miles in width. The tillable land extends only thirty acres in its widest portion, and about ten acres in its narrowest part back from the river; behind this, the land is too low for cultivation, is partially covered with water during the winter season, and is affected by the tides of the Gulf. During the summer it is comparatively dry, and is covered with a species of coarse grass. This prairie land, as it is called, extends only a mile or so back of the arable land; beyond this, the land becomes low and marshy, covered by coarse reeds, and is intersected by a perfect labyrinth of bayous or natural canals which communicate with the gulf. The distance from the river to the gulf, I do not think is more than ten miles in its widest part, and one or two miles in its narrowest part.

This parish contains forty-three sugar plantations, producing from twelve thousand to eighteen thousand hogsheads of sugar annually. In its lower portion there are many small rice farms, and this section produces more rice than any parish in the State. Oranges are grown also in considerable quantities, and contribute largely towards the supply of the city of New Orleans.

INHABITANTS.—This is probably the oldest settled portion of the State, and contains a greater mixture of the *races* than any other region in the United States. The largest proportion of these are descendants of the French. The balance consists of Anglo-Saxon, Spanish, Italians and *Africans*, and a *mixture* of these in all grades and proportions. There is a large *free* colored population in this parish. Scattered along at intervals between the plantations, are many small neighborhoods or settlements, as they are called, consisting chiefly of the native creole population. Of these settlements,

there are six, which deserve more the name of small towns or villages.

1st. The Jesuits' Bend settlement; 2d. Pointe à la Hache; 3d. The Ronquille settlement; 4th. The Burat settlement; 5th. The Balize; 6th. The Southwest Pass. The Jesuits' Bend is situated on the right bank of the river (going down stream), and is twenty-three miles from New Orleans. It is divided into two portions, the upper portion being separated from the lower by two sugar plantations, making an interval of two miles between the two. The upper portion of the settlement contains eight families, within the space of six acres fronting the river, numbering in all seventy or eighty souls. The lower settlement contains about ten families, numbering in all between seventy or eighty persons.

The next village is Point à la Hache; it is forty miles from the city; it is the county seat; has a court-house, jail, and post-office; and contains within the space of a mile, probably two hundred persons. This village is on the left bank of the river.

The Ronquille settlement is on the right bank, and contains nearly as many inhabitants as Pointe à la Hache. The Burat settlement is seventy miles from the city, on the right bank of the river, is in the vicinity of the present quarantine station, and has about fifty families. Finally, at the mouths of the river, are the Balize and Southwest Pass settlements, consisting of pilots and their families, numbering in all from twenty to thirty inhabitants.

DISEASES.—By far the largest portion of the diseases of this parish are miasmatic, chiefly intermittent and remittent fevers, and so far as my experience goes, I have found them to yield readily to proper treatment, and they are not so often associated with local inflammations or congestions as I have observed in some other parts of the State. The next most frequent diseases are, dysentery and diarrhœa, particularly among the negro population. Many cases of Asiatic cholera occur annually; *it prevails* also more among the negroes than whites, and is more fatal to negroes. More cases occur in the spring (May and June) than at any other time. This disease is sometimes endemic on a plantation, while the adjoining ones would be singularly exempt from it.

Pneumonia occurs during the winter months, but is generally mild and easily treated. Worms are very prevalent, particularly among the negroes, old and young. Tetanus, both idiopathic and traumatic, is of frequent occurrence, mostly among the negroes.

The charbon, or pustule maligne, has occurred here frequently; it is a common disease here among the horses, mules, and horned cattle; a planter sometimes loses all his stock. In regard to the yellow fever, I have learned some interesting facts. Situated as this parish is, so near the city, and there being a constant intercourse between the city and the various plantations and villages, by the means of numerous sail-boats, which stop along the coast, carrying produce of various sorts to New Orleans and bringing merchandise to the numerous settlements, and also by a steam packet, which regularly stops once a week at every plantation and village between New Orleans and the Balize, one would suppose that yellow fever would be a common disease among its inhabitants; yet, upon diligent inquiry among the oldest and most intelligent persons, I am informed that the disease has never shown a disposition to spread until the year 1854. I have heard of many cases occurring in persons who having visited the city, have returned home with the seeds of the disease in their systems, and have died, throwing up black vomit. They were surrounded by their relations and friends during their illness, and yet no one took the disease from them. And even in 1853, when this disease was spreading terror and desolation in the upper parishes, it did not prevail here, although there were several cases in persons who had contracted the disease in the city. I may mention that this disease has never prevailed among the negroes; at least no deaths have occurred among them from this disease in this parish.

Another interesting fact was related to me a few days ago by an intelligent planter (a creole, who has resided here all his life); he says, that within ten or twelve years, many of the creoles here have sold their small farms to the sugar planters, and have gone since to reside in New Orleans. He can count upwards of twenty persons of his acquaintance, who, although many of them have now resided in the city several years, yet, upon diligent inquiry, he can learn of *one case* only of yellow fever among them.

In 1854, our parish seems to have lost its immunity from this pestilence. I was called on the 12th of September, 1854, to see an Italian, named Vincent, resident with a creole family. This family is in the upper Jesuits' Bend settlement, and consists of six persons, viz: the mother, a son eighteen years old, two younger children (one girl, ten years, and a boy eight years), also a married daughter aged seventeen years, and her husband (an Italian).

I learned this man had come from the city the day previous, and that he was unacclimated; had never spent a summer in New Orleans; had been in the United States four years. He had all the symptoms of yellow fever well marked, and was sick eight days in all. He recovered.

CASE 2. On the 18th of September, the little girl, aged ten years, was taken ill with the fever. I saw her twelve hours after, and she had unmistakable symptoms of yellow fever. She threw up black vomit, and died forty-eight hours after she was first taken ill.

CASE 3. The married daughter, aged seventeen (enceinte six months), was taken sick on the 24th with fever. The symptoms, though well marked, were mild. The fever lasted fourteen hours, and then subsided. I gave her quinine freely. The fever did not return.

CASE 4. The little boy, aged eight years, was taken on the 27th, having all the characteristic symptoms of yellow fever; was ill six days; was convalescent on the 4th. On the second day after the fever left his pulse was only fifty a minute. I gave him stimulants, and broth as nourishment. He improved and became rapidly convalescent.

CASE 5. The mother was taken on the 29th. Symptoms similar to the others. Was convalescent on the fifth day.

The young man, aged eighteen, left the house as soon as the Italian was taken, and did not return for two weeks; he escaped the fever. The nearest house above was half an acre; it contained a large family, fourteen persons in all; no one had the fever.

Another family, consisting of some fourteen or fifteen persons, residing half an acre below, became alarmed as soon as the nature of the disease was known, and left their house and went into the lower settlement; no one had the fever. No cases of fever occurred out of the infected house. As soon as the nature of the disease was known, no one visited the house. A neighboring planter kindly sent a negro woman, who was acclimated (having lived in New Orleans), to nurse the sick.

I wish I could give you a correct account of the fever as it occurred in the other settlements, but I have tried in vain to get at the particulars. All that I have learned is, that ten days after the disease made its appearance in Jesuits' Bend, it occurred in the Burat settlement, the fourth village from the city. It is said to have been brought there in the same manner that it was brought to the Jesuits' Bend settlement, viz: by an Italian boatman. It

was very fatal, only two or three persons recovered. More children than grown persons had the disease. A physician of the Ronquille settlement, which is twenty miles above the Burat (the late Dr. O. Hags), was sent for. He paid two visits at the village—contracted the disease, and died about forty-eight hours after he was taken ill. He threw up black vomit freely. He was attended by Drs. Egan and Boyer, who can inform you of the particulars of his case. He was visited and attended by his *friends* and relations, yet, no one else had the disease in the Ronquille settlement. About two weeks after the disease in the Burat, it prevailed at Pointe à la Hache, the second settlement from the city; it was thought to have been brought from the Burat settlement. The above were all the settlements in which the disease prevailed in 1854.

September 3, 1855. During the last week in August, I was called to see seven cases of fever in one house, all sick at the same time, three white, and four blacks. Looking upon them as mere cases of bilious intermittent fever, I prescribed for them accordingly, ordering quinine to be freely given immediately on the subsidence of the fever. All these cases did well. Two days after, while passing the house, I was called in to see another member of the family, a young lady, of eighteen years, and found her extremely ill. She was throwing up black vomit, and passing the same from her bowels. She had been taken ill three days previous with fever, accompanied with violent pain in the head, back, and calves of the legs. She was treated by her mother with the usual creole remedies in such cases, viz: hot pediluvia, cold applications to the head, frequent sponging with tepid water and vinegar. She had been given an emetic of ipecac, followed by a dose of Epsom salts, as her fever had continued without remission. She had taken no quinine. I found her restless—much frightened—skin hot and dry—pulse one hundred and twenty, but feeble—tongue dry, but not furred. She complained of soreness in the fauces. Sclerotic slightly yellow—tenderness over epigastrium—suppression of urine. I cupped over the seat of pain, and the pain continuing, applied a blister over the abdomen, and dressed it with morphine cerate—gave her ice to hold in her mouth. She continued to throw up black vomit at intervals of four or five hours, and died thirty-six hours after the black vomit began. She was given strong chicken broth as nourishment, and stimulants also. During the intervals of vomiting, she was quiet and free from pain. She became extremely yellow after death.

As soon as this person died, the family removed to a vacant house, one acre distant from their dwelling. In six days after their removal, a younger sister was taken with the fever, and within the space of ten days, every member of the family had had the fever—white and black, fourteen in all. The following were the general symptoms of nearly all the cases; in some, the disease was much milder than in others.

The disease began with violent pain in the head, back, and limbs; the face flushed. The fever began with the pains; the eyes were more or less red; the pulse varied from one hundred and eight to one hundred and twenty; the tongue in general was moist; bowels rather torpid; the skin was hot, but easily made to perspire. In some cases, there was pain over the epigastrium, and some nausea at the beginning of the attack.

Treatment.—I pursued the abortive treatment. The family had become alarmed, and I saw every case early. My plan was, first, to give a mercurial *purge*, blue *mass* or *calomel*, followed in four hours by castor oil. I endeavored to promote free perspiration, by means of hot mustard pediluvia and warm orange leaf tea, and keeping the patient under cover. As soon as free perspiration was established, I gave thirty grains of quinine in two doses, one hour or so apart. I gave it in this way for fear the stomach would reject the thirty grains at once, which was done in one or two instances. Under this treatment, the patient was relieved in from fourteen to twenty hours. I kept them in bed until after the fifth day—on the second day, I gave the following diaphoretic mixture to keep the skin moist.

℞.—Aqua camphoræ ℥j;
Spt. nit. dulc., } āā ℥ss;
Spt. mindereri, }
Paregoric ℥ss.—M.
A tablespoonful every two hours.

I gave them ice to hold in the mouth when it could be had; gave mucilaginous drinks, sometimes acidulated with oranges (green). On the second day, gave chicken broth, gradually increasing it on the third and fourth day. Some of the cases were exceedingly prostrated. To these, I gave stimulants cautiously (usually gave brandy julep). Besides the members of this family, I had four cases in the adjoining houses; most of them had been with the sick family as nurses. Free communication was kept up between the families. No precautions taken to isolate the disease. There was

a great deal of prostration considering the short duration of the disease; more so than in the ordinary fevers of the parish.

In searching for the cause of this disease, I learned that the family had a negro woman hired in New Orleans. This woman came home sick with a mild fever, about six days previous to the first cases of fever in the house. She brought her bedding and many articles of merchandise with her. The woman soon recovered, and returned to the city. The first cases of fever in the family were among the negroes; in them the disease was more mild than in the whites. Up to the time of the sickness in this family, the neighborhood had been remarkably healthy, and the *black vomit* case is the first and only white death in my practice this year.

Thus, I have given you an imperfect account of the yellow fever as it has occurred in this parish. I have endeavored to give all the facts in regard to the supposed origin of the disease. I do not pretend to *theorize* upon them. I only vouch for the accuracy of my own cases.

I did not deem it necessary to go into the minute detail of every case, with symptoms and treatment, although I have taken notes of most of them.

Hoping you will make due allowance for all imperfections,

I remain, your friend,

D. R. FOX.

V.—*A Report of the Yellow Fever at Centreville, in* 1855, *with some Remarks on the Disease as it appeared in the Parish of St. Mary, in* 1853, '54, *and* '55. By WM. B. WOOD, M. D.

Centreville, situated on the Bayou Têche, in the Parish of St. Mary, in the midst of a very densely populated sugar-growing region, five miles below Franklin, and twelve miles above Pattersonville, contains a population of about 200.

In September, 1853, the yellow fever made its appearance at this place, for the first time, as an *epidemic*. Indeed, so far as I am informed on the subject, for the first time in any shape.

An account of that epidemic has already been published in the "Report of the Sanitary Commission of New Orleans, on the epidemic Yellow Fever of 1853," and also in "Dr. Fenner's report to the American Medical Association, on the Yellow Fever and Cholera of 1853."

During that epidemic, about 45 or 50 cases of fever occurred in

the village, between the 18th of September and the 18th of November, the period at which the disease disappeared.

It also prevailed in an epidemic form at Pattersonville, at the same period of time (an account of which was published by Dr. Grout, of Pattersonville, in 1853), and in other portions of the Parish below this; while the upper portion of the Parish, including the town of Franklin, remained entirely exempt from yellow fever, with the exception of one family in Franklin, a report of which was made by Dr. Lyman, of Franklin, in a letter to Dr. Fenner, and published in New Orleans in January, 1854.

In September, 1854, the yellow fever again appeared in Pattersonville in an epidemic form, and also at Franklin, and upon the plantation of Judge Baker, four miles below Centreville. Of these places, Franklin, and Judge Baker's plantation, were severely scourged, while Centreville, lying midway between, remained entirely healthy during the whole season, escaping the yellow fever altogether, with the exception of two or three cases, contracted in Franklin. Of these cases, one died with *black vomit*, in our midst, and yet the disease failed to spread, or communicate to any one else in the village, notwithstanding many were exposed to it who had never had yellow fever.

Does this fact favor the doctrine of *contagion?*

But let us follow its history on another year. And this brings us to the period more especially for which *this* report is intended.

The history of the fever at Centreville, for 1855, presents more than ordinary interest, from the fact, that at *one time* in its progress, it was admitted on all hands to be *genuine* yellow fever by those who examined the cases, and, at another time, disputed by those who had already conceded the fact.

There was another class also, who, having neither the courage to approach near enough to the village to examine a single case, nor the capacity to judge correctly of the facts, could, standing off at the safe distance of five miles, in company with the *publisher* of that interesting 8 by 10 sheet, at Franklin, styled "The Planters' Banner!" assert most positively that there had not been a single case of yellow fever at Centreville, and that the disease which prevailed there, in an epidemic form, and pronounced to be yellow fever by six physicians, all of whom had examined the cases, was in fact nothing but "*Dengue!*"

But to the history. In September, 1855, we find the fever again making its appearance at Pattersonville and Centreville about the

same period of the year, and in exactly the same form that it did in 1853, prevailing to about the same extent in Pattersonville as in 1853, but to double the extent in Centreville with regard to the number of cases, and perhaps a little milder in its type, while the town of Franklin, scourged in 1854, remains entirely free from epidemic yellow fever in 1855.

We hear nothing in 1855 of "barriers thrown across the public road a half mile below the town of Franklin," as in 1853, and an *armed guard* stationed there to "fence out" the yellow fever, and to keep off the citizens of Centreville and Pattersonville from Franklin, lest some of the poisonous infection might attach itself to the clothing of those coming into the town, and Franklin become again the victim of a yellow fever epidemic! On the contrary, the most constant and intimate intercourse is kept up between the three places during the whole prevalence of the epidemic, both by the bayou and the public road, and yet Franklin remains, as in 1853, uninfected.

Does this state of things favor the doctrine of contagion and importation? Not at all! But, say the advocates of this doctrine—and, of course, the advocates of quarantine—as this disease failed to communicate itself to our town and become epidemic, and as there were some eighty or ninety cases of the fever at Centreville and only *one man died*, it could not have been *yellow fever*, and must have been some other disease! It did well enough for *yellow fever* at Pattersonville, because a good many died! *Symptoms* all right at Centreville—*looked exactly like yellow fever!* acted exactly like it in all its stages; but as only one man could be found in the place possessed of sufficient patriotism to give the disease a fair chance at him, and in the conflict to fall a victim—not only to the disease but perhaps to his own folly—that therefore it could not have been yellow fever!

But they must give the disease a *name*, at all events. It would not do to call it bilious fever, as that disease never appears in an epidemic form of this kind. It would not do to call it intermittent fever, because the fever was not of an intermittent character. It would not do for scarlet fever, for there was no scarlet appearance of the skin, and sore throat. It would not do to call it "ship fever," or "Chagres fever," because the bark "Tivoli" hadn't been around this fall, to be "overhauled and cleaned," after lying *high and dry* several weeks, entirely empty, on the sand-bar at Last Island! It would not do to call it the hooping-cough, because of there being

no cough that could be *heard!* But as "Dengue" was a term not well understood, and might be used to mean almost anything, it suited the purposes of the "wise men of Franklin," through their organ, the *Planters' Banner*, to christen the yellow fever at Centreville in 1855 "*the Dengue.*"

Some of these Franklin people are great *contagionists* and *quarantinists.* They could see no possible way for the yellow fever to get into Franklin in 1853, and appear in the family of Mrs. Smith alone, as it did, except through the medium of a "box of axes" or a "paper package containing India-rubber coats," arriving directly from New York in a vessel by the way of Centreville! And, strange to say, the "negro man who carried them" from Centreville to Franklin, and the clerk in the store who *received* and *opened them* at Franklin, escaped entirely.

Again, in 1855, we find that two persons actually die of yellow fever, with black vomit, in the town of Franklin—Captain Leaky, disease contracted at St. Martinsville, and Mrs. Cooper (how contracted unknown), and the yellow fever fails to spread or to communicate itself to a single individual among all the nurses and attendants! And yet we find persons contending everywhere that yellow fever is a *contagious* disease, and nothing but *quarantine regulations* can prevent its spread!

But let us proceed with our examination into the history and symptoms of the epidemic fever, as it prevailed at Centreville in September and October, 1855, and determine, if we can, whether the physicians who examined the cases and treated the disease were right in calling it yellow fever.

During the months of May, June, and July, there prevailed in Centreville and in the surrounding country the usual amount of intermittent and remittent fever, mild in type and yielding readily to medical treatment.

We had also, especially in June, July, and a part of August, among the negroes on many of the plantations, the flux, which was often troublesome to manage, and sometimes fatal; and the hooping cough prevailed extensively among children the whole season.

The spring and early part of the summer were unusually dry; but in July and the early part of August very large quantities of rain fell, and the rays of the sun were exceedingly hot, and flies and mosquitoes became very numerous. During the month of August there were a few cases of bilious remittent fever on the plantations around, but scarcely a case of fever of any kind occur-

red in the village during August and up to the time of the epidemic on the 8th of September.

On the morning of the 9th of September I was called to visit Mr. Hine, a merchant of our place, who was taken sick on the evening before with a slight chill, followed by fever, violent pain in the head, back, and eyes; eyes suffused aad injected, and very sensitive to light; complained of great pain in the eyeballs; tongue rather clean, and pulse about 110. His fever continued between two and three days, and went off very gradually. On the 9th another case occurred, Mr. Bonta; on the 10th two others, Mrs. Whitworth and George Rogers; and in less than *ten days* there were between thirty and forty cases of exactly the same kind of fever under treatment in the village, and this, be it remembered, out of a population of only about two hundred.

Of these four cases, three of them were under my treatment, all of which I pronounced *yellow fever*. The other case, treated by Dr. Fassitt, was pronounced by him to be yellow fever *at the time*.

Subsequently, Drs. S. Allen, C. M. Smith, and J. W. Lyman, resident physicians of Franklin, came down to Centreville, and were invited by me to visit and examine some of the cases under treatment at the time; and all of them gave it as their opinion, after so doing, that the disease was *genuine* yellow fever. Dr. Ethan Allen, another physician of our place, was taken sick himself soon after the outbreak of the fever, and saw very few of the first cases, enough, however, to satisfy him, as he told me, that the disease was yellow fever, of a mild type.

Dr. Fassitt, who treated a number of the cases during the epidemic, entertained no doubt of the disease being *genuine* yellow fever, until his patients *refused to die!* and so expressed himself to several persons in and out of the village. This fact was sufficient, perhaps, to create a *doubt in his mind*, when he reflected upon the success which attended his practice in the treatment of the yellow fever of 1853 and 1854. But I am of opinion that if he had pursued the same practice in 1855 that he did in the yellow fever of 1853 and 1854, he would have had no grounds to doubt, at least upon that score. He treated the man (from the third day of his illness), who died at the hotel on the 23d of September, and informed me that a dark looking matter, which ran freely from his nose and mouth some twelve hours after death, was, in his opinion, genuine black vomit. This *corpse* I also examined myself, some twelve or fourteen hours after death, and I entertained no doubt,

from the appearance presented, and from what I had learned of the history of the case, before death, that this man's disease was yellow fever. And I agreed with Dr. Fassitt, in the opinion expressed, that the dark matter running from his nose and mouth at the time, was genuine black vomit. Indeed, I have not the slightest *doubt* on that subject. It was as pure looking black vomit as I ever saw thrown from the stomach of any case of yellow fever.

This man was a German by birth; appeared to have been but a short time in the country, as he could speak but little English; was a carpenter by trade, and had been at work in Centreville but a month or two when taken sick. When attacked with the fever, he refused to allow a physician to be called to treat him, and undertook the management of his own case.

From this circumstance (and all the cases appearing to be of a manageable type), I felt anxious to see how a case of fever would terminate when left to nature and the nurse. And hence I watched the progress of his case from time to time as I passed by the door of his room at the hotel, while attending to a patient of my own in the next room, with the same disease. And from what I was able to see myself and learn from his nurse, a countryman of his, who attended to him, I found that he was taken sick exactly like a majority of the cases under treatment in town, viz., chill, followed by fever, pain in the head, back, and eyes. Eyes injected, and very red; tongue clean and moist at the onset, and looking almost natural. Indeed, I did not find a dry tongue among all the cases I attended during the epidemic. Skin hot, in this case, but *easily* induced to sweat; pulse from 110 to 120; the fever continuing along from day to day, with no intermission, and very slight remission.

He had, from time to time, hemorrhage from the nose and gums. The pain in the head and back continued, with the fever; and the nurse said he never slept at all.

His treatment, in the beginning, consisted of a dose of rhubarb, followed by castor oil, which acted freely on his bowels, and his discharges appeared consistent. He kept very quiet in bed, drank warm tea from time to time, and sweated freely, for the two or three days that I noticed him, and I thought, at one time, that he would recover.

However, getting no better, I presume, about the third day of his illness, Dr. Fassitt was called in to take charge of the case (as I was informed), by Cary, the hotel keeper. After this period I saw

little or nothing of him until the evening of the fifth day of his attack, when he was said to have *spasms*, and I walked into his room in company with Dr. Fassitt. He was then struggling with strong spasms, and requiring the exertions of two men to hold him in bed. His face was flushed, and his pulse strong and full. Dr. Fassitt corded his arm and bled him from a free orifice, about a quart. Blood dark, and appeared to coagulate in the bowl. Under the bleeding, he calmed down. I know not if anything else was done for him at the time, as I shortly after left the room.

Dr. F. being called away shortly after, requested me to call back to the patient's room again and see him. I did so in about an hour, and found him dead.

Had this man's case not terminated fatally for twenty-four or forty-eight hours longer, I believe he would have thrown up black vomit before death. As it was, the blood was not sufficiently *dissolved* to enter the stomach through the coats of the mucous membrane. He had, however, as before stated, hemorrhage from the nose and gums, before death, and I am fully satisfied the dark matter running from his mouth and nose, at the time I saw him, 14 hours after his death, was the genuine black vomit of yellow fever. This was the only case of fever that died at Centreville during the epidemic, out of some 80 or 90 cases, and this was the only case that was not *promptly treated* by a physician, *from the beginning of an attack.*

The fever was uniform in its character in every case; continuing without any intermission, and very slight remission, for from two to four days; and once off showed no disposition to return again, except in case of a relapse. Indeed, in every case, it was a fever of one paroxysm, lasting about three days, attended in all cases, with more or less pain in the head, back, and eyeballs; the pain generally continuing along with the fever, and going off only as the fever subsided. In some cases, there was bilious vomiting in the beginning of the attack. In at least one-half of the cases, however mild, there was more or less hemorrhage from the nose and gums; and in many of the more violent cases, there was tenderness over the region of the stomach, with vomiting, belching, and hiccup, and in every case there was very great *prostration* of strength following the decline of the fever. The red and injected appearance of the eyes was generally followed by a dull yellow look of the conjunctiva, and yellowness of the skin attended many of the worst cases of the disease.

The fever began to abate after the middle of October, and by the 10th of November had disappeared entirely. And in this particular resembled exactly the course of the epidemic of 1853, which lasted about 60 days.

Indeed, I could discover no difference in the symptoms and character of the epidemic of 1855 and that of 1853, at Centreville. Both observed not only the same laws in their progress, but the same geographical limits within the village, extending as far up and down the bayou, and along the public roads, as in 1853, and no farther.

As in 1853, it refused to extend itself into the surrounding country. Several from the country exposed themselves to the disease in the village, contracted the fever, returned home, were nursed and attended by their families during the period of their illness, and yet not a solitary instance occurred, in which the fever was communicated to a single individual member of the family, outside of the village.

This was the case also in the epidemic of 1855. The disease could only be contracted within the limits of the infected district, and was not capable of propagating itself from person to person in the country, among those exposed either by contagion or infection.

One argument used by those who contend that the disease could not have been yellow fever in 1855, is that the fever attacked all persons indiscriminately; those who had had the yellow fever in 1853, as well as those who had not. *This is not a fact.*

I do not believe a single case occurred in Centreville of well marked yellow fever, during the epidemic of 1855, in the person of any one, supposed to have had *genuine* yellow fever during the epidemic of 1853. My opportunities of judging correctly on this point will certainly not be disputed, as I treated nearly all the cases in 1853 in the village, and a large majority of them again in 1855. I know that *some few* had fever during both epidemics. But when we understand that *every case* of fever that occurred during the two epidemics was not yellow fever; and that a number of cases of *plain intermittent fever*, and a few cases of well marked *remittent bilious fever*, so *plain* that a *nurse* could at once detect them—occurred during the epidemic in both years; then, it is not to be wondered at, that some few persons who had fever in 1853, should have fever again, *of one sort or another*, during the epidemic of 1855!

In the family of John Rogers, his wife alone had yellow fever in

1853, while in 1855 every other member of his family, himself included, had yellow fever; his wife nursed them all; and yet she escapes the fever entirely in 1855.

In the family of Ralph D. Smith, his wife and daughter alone had yellow fever in 1853. In the epidemic of 1855, nearly every other member of his family, himself included, had the fever, and the wife and daughter escape.

Other instances of a similar character could be given, but these are deemed sufficient.

Whole families escaped in 1853, and were nearly all sick during the epidemic of 1855.

Dr. Fassitt *thinks* he had the yellow fever in 1853, and says, he had the *prevailing fever* during the epidemic of 1855. And this, I understand, to be the second ground upon which he predicates his opinion, that the epidemic fever of 1855, at Centreville, was not yellow fever.

It was a very easy matter for him to have been *mistaken in his own case.* Physicians are not always the best judges in their own cases.

And, it is also *possible* for Dr. Fassitt to have had yellow fever *both seasons.*

Persons have undoubtedly had the disease *twice*, if we are to rely upon reports made by physicians, and I am sure I am not prepared to say that a person might not have yellow fever, even oftener than twice under some circumstances.

Some expose themselves freely, and never have the disease at all. This has been my own case. Although exposed to yellow fever in 1843, 1847, 1853, 1854, and 1855, I have so far escaped the disease entirely.

Entertaining *no fears for my personal safety* during the prevalence of yellow fever as an epidemic, perhaps has contributed more than anything else, to my entire exemption from the disease, during the several years in which I have been exposed.

The *treatment* adopted at Centreville, during the epidemic of 1855, was very simple and very successful. That which I had used here so successfully in the yellow fever of 1853, was the *general* treatment which was followed in 1855. The disease being mild in its type, and no *panic* arising among the citizens on the subject of the epidemic, it yielded more readily to medical treatment.

A mild mercurial cathartic at the commencement of the fever, followed, some hours after, by a moderate dose of castor oil, to

evacuate the bowels fully; together with warm orange-leaf tea as a drink, and hot mustard foot-baths, to induce free perspiration during the continuance of the fever; and perfect quiet in bed under blankets, constituted, generally, the *medical treatment* during the paroxysm of the fever.

In some few cases attended with vomiting at the beginning, a gentle emetic of mustard and common salt, in warm water; or, of ipecac., was given first to empty the stomach, and to assist in developing the fever. This generally induced free perspiration at the start, and tended somewhat to lessen the pain in the head and back. No nourishment was allowed until after the fever began to subside, or most generally, until after it had gone entirely off, when gruel, chicken water, or beef-tea, were allowed in small quantities; and brandy toddy, brandy julep, or champagne wine in ice, were given in such quantities as nature required, and the stomach would bear.

While the fever was subsiding, or after it had gone off, a dose of sulph. morphine was sometimes administered, to quiet nervousness and induce sleep; when this could not be taken safely, owing to any idiosyncrasy in the case, a stiff brandy toddy was sometimes given, with a very good effect.

No change was allowed to be made in the bedding or clothing of the patients, between the period when the fever subsided, and the sixth or seventh day of the attack, and the most perfect quiet enjoined upon them, until after this period. This, as a general thing, constituted the treatment pursued in a majority of the cases. Some cases, differing from the general run, being more violent in their type, required some modification in their mode of management.

Speaking of the use of brandy toddy in this disease, I will here remark, that it will be found one of the very best remedies we can use to arrest black vomit, and save the life of the patient, after that alarming and fatal symptom has made its appearance.

In one case which I had in November, 1854, of a lady on Bayou Salé, in this parish, the wife of a sugar planter, I arrested black vomit, which had continued at intervals for six hours, to be thrown up in small quantities, by the *free* use of brandy toddy alone, and the lady is now living to testify to the fact. And although I have seen several die with black vomit, this was the first case of recovery in an adult that I ever witnessed myself, after that fatal symptom had supervened.

My manner of using the brandy toddy on the occasion, was this:

I mixed half a glass of the strong toddy at a time, and then gave the patient two or three swallows of it, after every effort at vomiting.

At first, the toddy was instantly thrown up, and the patient declared to me that it was too heating to her stomach, and that it made her vomit more. To this, however, I paid no attention, I had tried so often before, almost every remedy that suggested itself in such cases, and failed to do any good; and I had tried the plan of keeping everything out of the stomach, and yet the case would die, whether the vomiting ceased or not; that in this case, I determined to push the brandy, and give the remedy a fair trial. And after every effort at vomiting, which came on at intervals of about ten or fifteen minutes between, I gave a few swallows of the toddy—strong toddy—for my patient was *fast sinking*, with cold clammy skin, small pulse, and hiccuping at every breath. In about an hour's time the toddy began to stick on the stomach, and the black vomit to be thrown up in smaller quantities, and requiring great effort; and in three hours' time, I had not only arrested all vomiting, but I had obtained a warm healthy glow of the skin, and the pulse had become full and round.

She was kept very quiet, and for the twenty-four hours that followed she took nothing on her stomach but small quantities of the brandy toddy, at longer or shorter intervals, as the state of the skin and pulse seemed to indicate. On the second day, I substituted champagne wine for the brandy toddy, and allowed some arrow-root gruel, which was followed by broth, etc. As stated before, the lady recovered, and is now in the enjoyment of excellent health.

A few words as to the origin and spread of yellow fever, and I will close this report. I do not believe yellow fever to be *contagious*. I have seen much of the disease for several years past, and I have been unable to discover a single fact, which could induce a belief in my mind, that the disease is contagious; or, that it can propagate itself from one person to another, as we know that small-pox, measles, and other contagious diseases, possess the power to do.

I believe the *poison* which gives rise to yellow fever, to exist in the atmosphere; is generated under peculiar circumstances, requiring the influence of certain degrees of heat and moisture, added to animal and vegetable decomposition; that this power, when generated, is of local origin, and confined to certain circumscribed dis-

tricts of country, or portions of our country; and that all who enter within that infected circle, and breathe the air, are liable to take the disease.

That this poison did originate spontaneously at Centreville, both in 1854 and 1855, and that yellow fever here, owed its origin to *local causes*, and not to importation from any other place; that yellow fever will not always spread from the introduction of a case of the disease into a family or community, is established by the fact, that it failed to spread at Centreville, when introduced in 1854, and also, in Franklin, when introduced in the persons of Capt. Leaky, and Mrs. Cooper, in 1855, notwithstanding the disease had prevailed in an epidemic form only the year before, at both places, and cases terminating in black vomit were introduced in both instances, and the whole community were more or less exposed.

Indeed, a hundred instances could be given of just such facts, of persons dying with yellow fever at different places, and nobody else contracting the disease. In some instances, as was the case in this parish the past fall, a whole family, consisting of the father, mother, and two children, all died of yellow fever in one house, while on a visit to a relative; and although nursed by the members of the family of the relative, at whose house they were visiting, not a single case of the fever occurred among all the nurses and attendants!

None of the first cases that occurred at Centreville this fall, had been exposed in the slightest degree to yellow fever, from any other point. It is true, Mr. Hine had returned from New York, about fifteen days before his attack. But he came down the Ohio and Mississippi rivers, and not by New Orleans; and in coming home, never made the least stop at any place where yellow fever was supposed to exist. Of the three other cases taken sick about the same time, none of them had been out of Centreville to expose themselves. All lived in different parts of the village, and only two of them had been near enough to Mr. Hine to speak to him since his return from the North.

CENTREVILLE, LA., December, 1855.

VI.—*Yellow Fever in Thibodeaux, La., in the year* 1854. By M. A. McLEOD, of Thibodeaux.

Previous to the appearance of the yellow fever here this year, we had very unsettled weather—rain almost every day—yet there was nothing in or about the town that would indicate sickness of any

kind, and up to that time during the summer, the place had been remarkably healthy.

The first case occurred in September. On the 12th day of that month, I was informed that there was a case of yellow fever in town; the sick man was an Italian, who had recently returned from New Orleans; yet, the attending physician did not pronounce the case yellow fever (perhaps not wishing to create an alarm). My informant was one of the nurses, and non-professional, but he had seen and nursed a number of cases of yellow fever the previous year, and he did not hesitate to pronounce this a well developed case of that disease. The Italian recovered. On the evening of the 20th of September, some of our unacclimated citizens became alarmed; it was reported that a tailor on the opposite square from where the Italian was sick, was dying of yellow fever, and I was asked to go, and if possible, ascertain the correctness of the report. I called at the house next morning, but the man had died during the night. I met the attending physician (who was the same that had treated the Italian), but he gave me very little satisfaction in regard to the case, and stated that the patient had thrown up black matter, but he rather looked upon his disease as cholera.

September 22d, a woman, near the above, and on the same street, and opposite to where the Italian was sick, died this day of yellow fever, pronounced such by her attending physician, Dr. J. W. Deadrick. A German gardener, who resided four miles above the town, was in the place, and assisted in putting the corpse in the coffin, and attended the funeral. He went home, and a few days after he was taken with fever and was removed back to town. On the night of October the 4th he died with black vomit. This was likewise the patient of Dr. J. W. Deadrick, and it was the first case of black vomit I saw this year. About this time, the fever appeared to have spread pretty much throughout the town, and all our physicians reported a greater or less number of cases, which alarmed the unacclimated, many of whom fled to the country, and remained there secure until we had frost.

Now, I have no doubt but the first case of yellow fever here this year, was the Italian's, and he brought the disease from New Orleans, and from him it spread throughout this place. We could not trace it distinctly from one person to another, yet, there are some few cases where we could trace it distinctly, such as the following:—

An Episcopal minister (Mr. Trader), who came to reside here

last spring, and was unacclimated, visited a young man who lay sick with fever, and a few days after, he went about a mile in the country (at Judge Guion's), to dine. After dinner it rained, and he was prevailed on to spend the night; some time in the course of which, he was taken with yellow fever, and remained there until he was convalescent. A few days after this, the family where this man was staying, were taken with the fever, and one, a very interesting daughter, died. A son-in-law of Judge Guion, Dr. Young, who resided in Houma, sixteen miles from this place, where there was no yellow fever, came up with his lady to attend on the sick, and while there, they were both taken with the fever, and the Doctor died.

There are other instances here where the disease appeared to spread by contagion, and, in fact, it was far more traceable from person to person, than an epidemic of smallpox has been, which we have but recently passed through here.

A man came from New Orleans here with smallpox, and so soon as it was ascertained that he had the disease, he was removed without the limits of the town, where he died, and his clothes were there burned. Yet, in ten or fifteen days after this the smallpox broke out in all quarters of the town, the cases within a few days of each other. In the most cases it was in persons who had not been near the sick man, and I look upon it just as easy to account for the spread of one, as the other. I do not pretend to say that the contagion of yellow fever is as virulent as that of smallpox under all circumstances, yet, it may be so in tropical climates where it is endemic. I look upon yellow fever as an imported disease, and whenever this or any other climate assimilates in temperature and other things that where yellow fever is indigenous, let the contagion once be started, and it will spread from person to person, until we have a change in temperature to check it.

The fever continued to attack the unacclimated until we had a killing frost, which occurred on the 15th of October; and even after this we had a good many cases, but it was among persons who had been exposed to the disease previous to the frost.

One recovered after black vomit in my practice. Now, in regard to the treatment, so much has been said, that I deem it unnecessary to speak of that in detail. But I look upon it, that remedies that might be found efficacious in one locality, might not answer so well in another, as the yellow fever, I think, is apt to partake of the nature of the prevailing disease of the particular localities where it

spreads, and no doubt requires to be treated accordingly. And this will account, in a measure for the different successful treatment in different places, although they may be the opposite of each other.

The treatment I found most efficacious, was to open the bowels freely at the start; mustard foot-baths and warm teas, until the fever had subsided; and then, stimulants or not according to circumstances. I used very little quinine.

The muriated tinct. of iron I used to some little extent, but not sufficiently to speak of its effects, either *pro* or *con.*

VII.—*An Account of the Epidemic Yellow Fever at Cooper's Wells, in Hinds County, Miss., during the Summer and Autumn of* 1855. By J. S. BEAZLEY, M. D.

I visited Cooper's Wells in November last, after the subsidence of the memorable epidemic, and must confess, I could discover no evidence of a *local cause* that I would consider capable of giving rise to such a disease. I therefore think there must have been some *foreign influence*, or else a very *extraordinary condition of the atmosphere*, that caused the endemic fevers of the place to assume or run into the *yellow fever type.* You will perceive, that Dr. Beazley mentions the abundant prevalence of *intermittent fever* at the time of the outbreak of yellow fever. To use his own language, "the change was gradual, a running into yellow fever as it were."

The Doctor appears to attach much importance to the apparently infectious communication that could be traced in every instance where cases occurred in the neighborhood, with the exception of *one family;* but, strange to say, that was the only case in which the disease ran through the whole family. This would appear to prove the *necessary presence* of some *local* cause or influence at that spot, or, at least, that the disease is incapable, *per se*, of regenerating its own poison, and thus spreading from person to person. The facts bearing on this point that have been observed within the last few years, really appear to be so contradictory, that it is almost impossible to get at their true meaning. I am happy to find some of my own observations and conclusions respecting yellow fever, supported by the testimony of Dr. B.; such as the close relationship between the different types of fever prevailing, and the difficulty of distinguishing them—the extraordinary mildness of the symptoms in many cases, as I witnessed in the Norfolk epidemic—attacks sometimes attended with bilious vomitings, contrary to the rule laid down by Dr. Nott, of Mobile; the beneficial effects of sponta-

neous hemorrhages from the nose and gums; the fatal effects of suppression of urine, etc. In short, Dr. Beazley's letter is very valuable, and I commend it to the special attention of your readers.

E. D. F.

COOPER'S WELLS, March 6th, 1856.

DR. E. D. FENNER—Dear Sir: Agreeable to promise, I will endeavor to give you a short history of the epidemic, as it occurred at Cooper's Wells during last summer. Not having taken notes of the cases under treatment for yellow fever, I cannot enter into a minute description as to symptoms, or management in any particular case. My object will only be to give you a general outline of the prevalence of the fever at this place and vicinity.

The visitor on arriving at Cooper's Wells, will not fail to be struck with the high and elevated location of this justly celebrated watering place, the romantic scenery, and the rolling character of the country in every direction. Owing to its natural advantages in this respect, there can be no accumulation of filth, animal or vegetable; every shower of rain washing the hills clean, and free from anything that is calculated to produce disease. No swamp or low marshy places in the vicinity giving rise to malaria.

Consequently, I think you will agree with me, from your knowledge of this section of Hinds County, that there is no local cause at this locality, capable of originating yellow fever. The question then, very naturally arises, in the absence of any proof of the origin of an epidemic at this point, how was it communicated here? Whether by the transmission of goods and baggage from an infected district, or by persons having been exposed to, and inhaling the atmosphere of a yellow fever region, and coming to the Wells, the disease developing itself after their arrival? I will mention a few facts just here, and leave you to draw your own conclusions.

A milliner, from New Orleans, came to this place early in the summer, rented rooms, and opened a lot of goods for sale, and was constantly receiving and opening boxes containing ribbons, silks, and fancy articles, from your city, during the prevalence of fever there. Several ladies who were frequently at her store and bought goods were attacked with fever, one of whom died with black vomit. This woman soon after took the fever, and also an Irish chambermaid, and several servants who occupied adjacent rooms. On the 8th of August (which was before the fever made its appearance in Vicksburg), there being an increase of company at the

Wells, the proprietor of the hotel went to the above-mentioned place, and purchased twenty mattresses, which were shipped immediately to this place. I mention this fact, because it has been frequently remarked and reported through the country that the mattresses were ordered from New Orleans. About the middle of August, two suspicious cases occurred, which created considerable alarm among the visitors, but not regarded as yellow fever by the attending physician, both of which died on the fourth or fifth day, with symptoms of fever, but no black vomit. Each of these cases came from a fever district a few days before they were taken sick. For a week or ten days there was no sickness of any description. On the 23d of August, a lady from Louisiana was attacked with fever; came through Vicksburg a short time before. On the 26th of August Dr. Pugh was attacked (the Doctor attended the cases above spoken of). Both of these cases died with black vomit on the fifth day. The prominent symptoms in these, as well as many other cases, were severe pain in the head, back, and calves of the legs, high fever, great thirst and restlessness, sick stomach, eyes injected, skin yellow, often hot and dry, and frequently a profuse sweat; but a steady, gentle perspiration, could not, in most instances, be kept up; tympanites and suppression of urine, coma and black vomit, would generally end the same on the fourth or fifth, and sometimes on the third day. During the week that the two latter cases were sick, I saw and treated some fifteen or twenty cases of well-marked intermittent and remittent forms of fever, all of whom got well, under a mild course of medication for those diseases. The fever then assumed a different type; the change was gradual, a running into yellow fever as it were, and spread rapidly, principally among the blacks.

At the commencement of the epidemic, dating from the 23d of August, there were about four hundred persons at the Wells, white and black, exposed up to the 31st of August, when the first death took place. Yet, I only heard of two cases of fever occurring out of this large number after they left Cooper's Wells. All who remained were connected with the establishment, numbering fifty, white and black. Of these, four had had the fever previously, and one escaped an attack. There were forty-five attacks and nine deaths—six whites and three blacks.

It may be well to remark that we had valuable aid in the persons of Drs. Hubbard, Buckner, and Brickell, of Vicksburg, and Dr. Cabaniss, of Jackson. And if a competency of good nurses could

have been procured, I am inclined to think, that the mortality would have been diminished to half the number reported, the majority of cases assuming a mild form. I was called to see a number of fever cases between the Wells, Raymond, Newton, and Jackson, all in the same county. Whenever I was called to patients in the country, I endeavored to find out, if possible, whether they had, at any time, been where the fever was prevailing. They answered me invariably in the negative. But, on pressing my inquiries, I found that they had been brought in contact with goods recently received from an infected district, either at the store or by shipments made to them by their merchants at Vicksburg or New Orleans. Others had visited the rooms of the sick. In one family where the fever prevailed to an alarming extent, I was not able to trace the origin of the fever among them to any other agency than the transmission of some morbific matter through the medium of the atmosphere. The attacks here were violent. There were in this family twenty persons, white and black; nine were attacked (seven whites and two colored); three deaths, two whites and one black.

This was the only place in the country that the fever spread to any extent in the same family. It has frequently occurred to me, during the epidemic last summer, that it was strange, where so many in the same family, often in the sick-room, and acting as nurses, did not have the fever, if, as some writers hold, yellow fever is contagious. I could mention several instances where only one in a large family had the fever without communicating it to any other member, notwithstanding the relatives mingled freely in the sick-room. In many cases that came under my observation the advance of the disease was very mild; the patient complained but little, generally of a fulness or tight feeling in the head, a sensation of weariness in the lumbar region, tongue slightly coated, often clean, and but little fever. In several instances it was difficult to determine at first whether the patient had the fever or not; but in a short time more urgent symptoms supervened and removed all suspense with regard to the true nature of the case. In others the attack was open and bold; high fever, severe pain in the head, neck, back, and limbs, very restless, sick stomach, with bilious vomitings, etc. I witnessed one case in which the patient at the onset of the disease became delirious—recovered after a protracted illness. In two others hunger was a prevailing feature, each attack mild. When hemorrhage occurred at the nose or mouth the case almost always terminated favorably. Black vomit was not common

in the epidemic here; but few recovered after this fatal symptom made its appearance.

In one case that had black vomit the discharge by the bowels seemed to be pure blood; after standing a short time it coagulated into a solid mass. And in another who had black vomit, the dejections were precisely the same as that passed from the stomach. Each case proved fatal. Suppression of urine was always a fatal symptom. When this secretion was scanty, or not voided for twelve or fourteen hours, it was often relieved by appropriate remedies. From the appearance of sudamina, convalescence most generally followed. In one case this eruption was superseded by a large number of boils all over the surface, from the size of a pea to that of a hazelnut.

It will not be expected of me, from my limited experience in the treatment of yellow fever, to contribute anything new to the mode usually adopted; but a few remarks under this head on the course pursued here will close this communication. The treatment carried out was principally on the expectant plan, which consisted (after putting the patient to bed, administering foot-bath, etc.) of a gentle purge of some kind; calomel and rhubarb were used, but I saw better effects from a simple dose of oil. Of the different alkalies lime-water was preferred, given early in the attack and continued during sickness. The object was to keep up a gentle perspiration all the time. As long as the skin acted well, nothing was done for the patient, unless symptoms called for more active remedies, beyond the use of cold drinks to allay thirst and adding as much as possible to the comforts of the sick-room. When high fever came on, with great thirst and restlessness, ext. aconite was administered with good effect, in from quarter to half grain doses every three or four hours, in order to reduce the action of the heart, and also for its diaphoretic properties. But this, I think, is a remedy that requires watching, as there is already too great a tendency to sedation in most cases of yellow fever. Mustard poultices to the stomach, and enemas of cold slippery-elm water, repeated every four hours, I found to have a fine effect where the febrile symptoms ran high, hot and dry skin, thirst, and tenderness on pressure of the epigastric region. Very decided relief was afforded the patient in every instance. Mucilaginous drinks in small quantity, iced if desired; cold douche to the head; stimulating frictions, as pepper and hot brandy to the extremities, when the capillary circulation was languid, were used with advantage. After total suppression of

urine no case got well. Where the secretion was suspended for a few hours, or passed in small quantity, the infusion of uva ursi, with sup. carb. of soda, was given with happy results. In fact, it did not fail in my hands to restore this function to its normal standard. No particular remedy was relied on to check the ejection of black vomit. After the febrile stage had subsided and the period of prostration came on, nourishing diet and stimulants to support the strength of the patient; chicken water and arrowroot often but in small portions; brandy, porter, and ale, according to the taste. Without wearying your patience any farther I will finish by stating the number of cases that occurred both here and in the vicinity. There were in all seventy attacks of yellow fever, as follows:—

Attacks—whites, 40; colored, 30—total, 70. Deaths—whites, 9; colored, 4—total, 13.

Hoping you may find something in this communication that will in some degree aid you in making out your final report to the Medical Association, I am, with high regard and the best wishes for your future prosperity and happiness,

Your friend,

J. S. BRAZLEY.

VIII.—*On the Topography, Climate, and Diseases of Washington, Texas.* By T. J. HEARD, M.D.

[The following paper from the border of the yellow fever area will be found interesting, as it touches upon the origin and relationship of the different types of endemic fever.—E. D. F.]

WASHINGTON, TEXAS, Feb. 8th, 1856.

DR. E. D. FENNER—Dear Sir: Dr. E. H. Hubbey told me a few days since, that you wished a paper from me on Yellow Fever. I have seen but little of the disease here; consequently, cannot have much to communicate on that subject as the result of my own observation; but I will give you an outline of my medical observations at this place, and if you find anything therein of any value to the medical public, you are at liberty to use it as you think proper.

I will in the first place briefly allude to the topography of this town. It is situated in about 30° 20′ north latitude; 100 miles from the city of Galveston, and about 150 feet above the Gulf of

Mexico. It is on the southwest side of the Brazos River, and opposite the junction of the Brazos and the Navasota.

The town is situated on a number of large hills, irregularly arranged, and bluffing up to within 100 yards of the river. The river bank is about 50 feet high above low water mark. The hills are so situated as to permit all refuse to run off the streets, being swept off either on to the beach of red alluvium at the foot of the hills, or into the river. The Brazos bottom is composed mainly of red alluvial loam, abounding in terrestrial testacea, vegetable mould, &c., and varies from three to five miles in width. The river bank on the bluff shores, to a depth of fifty feet or more, has identically the same appearance and composition as on the surface. The red loam and vegetable mould lie in regular alternate strata, though the strata differ in thickness as determined by the depth of water over the bottom and the number of days it has been submerged by each inundation.

The surface of the town site when first settled had the appearance of being little else than white sand. The stratum of sand varies from one to three feet in thickness. Below this there is a stratum of marl, with here and there sections of red clay and conglomerate sandstone to a depth varying from ten to fifteen feet; and beneath this we have hardly anything but white sand, and occasionally sandstone. At a depth of from 30 to 70 feet large quantities of fossils are found, composed, not only of shells, but the bones of land animals, not only of the known but the extinct also.

The rocks in this section are all conglomerate sandstone, abounding in water-worn pebbles and shells, chiefly marine. Springs are abundant in this section, and occur in almost every place where the rocks crop out, but the water is very impure, being impregnated with calcareous, argillaceous, and other mineral substances. Here, those who use spring or well water are not so healthy as are those who use cistern water.

I will next cursorily allude to the early settlement of this place, and to disease as it was then, and as it has been modified since, up to this time. In 1820 and 1821, Mr. Andrew Robinson made a settlement on the river bank half a mile below the present townsite. He made it his home until 1833. He used river water principally (which is brackish), and had but little disease in his family. In 1834, the present site was laid out into lots, and sundry improvements were made. The site on which the town is situated was densely timbered with post oak and thick hammock under-

growth. When the country was invaded in the spring of 1836, the population of the town was about 200. They nearly all fled before the invading army of Mexico, and had not all returned when I settled here in the fall of 1837. I was informed by the Hon. Anson Jones, M.D., and Mr. James B. Miller, that the diseases of the country prior to the time of my settling here, were simple in character and easily treated. They had both practised on the Brazos some ten or fifteen years before I came to the country. They treated cholera in Brazoria County at and near the mouth of the river in 1832 and 1833, but had never seen a case of it in the interior. Intermitting and remitting fevers were the diseases they chiefly had to contend with.

When I came here in 1837, the population of the town was about 500 citizens. Transient persons to a great number, consisting of disbanded soldiers, and adventurers from the States and Europe, flocked in rapidly.

The town tract, about one mile square, was strewed with the boughs of the trees that had been felled for building, and other purposes. We lived badly. We were neither well fed nor comfortably housed, and we drank bad water; hence, we had a great deal of disease, consisting mostly of intermitting and remitting fevers, with some cases of diarrhœa and dysentery.

The great quantity of vegetable matter in a state of decay, not only the boughs of the fallen trees, but a great amount of vegetable mould on the surface which had been for ages accumulating, and had been in the mean time sheltered from the rays of the sun, were at once exposed to his direct rays. From these causes poisonous emanations took place to a great amount, and sickened every person in town. This state continued until 1843, with very little variation. To pass a season in our town without one or more attacks of fever was almost a miracle, though our fevers were almost in every instance open and mild and readily yielded to treatment.

1843 is long to be remembered by old Texans. It rained almost the entire year. Our prevailing winds here are from the south, and our country is almost always healthy while they are regularly from that direction. But this year there was no regularity in them; we had no regular currents in the atmosphere. The winds amounted to little more than an ebb and flow. The clouds were often stratified, sometimes as many as three or four strata moving in different directions. The alternations of temperature were great.

Suffice it to say, disease was sown broadcast. Everybody was sick, and the fevers put on different livery from anything I had seen before. Ordinary congestive fever was common and of the most fearful type; the algid was by no means uncommon. With the return of cold weather, health was again restored to our population.

1844 and 1845 were only remarkable in one particular. Our town, in common with the country, suffered greatly from an erysipelatous fever, or what is ordinarily known as "*black tongue.*" The mortality among the aged, the infirm, children, and the intemperate, was very great. This disease prevailed in the winter and early spring.

In 1846, 1847, and 1848, there was nothing worthy of note. In 1846–7, there was a great deal of tonsillitis, pharyngitis, and such like afflictions. The ordinary fevers of the country have progressively declined both in frequency and intensity since 1843.

In 1848 and 1849, we had an epidemic of scarlatina.

In 1849 and 1850, a great number of cases of cholera were brought, mostly by steamboats. The mortality was considerable, mostly among negroes. Our citizens suffered a good deal from choleraic diarrhœa, but none died.

In the fall of 1850, typhoid fever first became manifest here, and has continued more or less up to this time, 1856.

1851. This year was healthy, with the exception of typhoid fever, diarrhœa, dysentery, and such like, until September, when in the course of a few days nearly our whole population (1000 to 1200) were prostrate with *dengue.*

1852. A very healthy year, with the exception of a few cases of typhoid fever, and a return of *dengue* in the fall, when all had it who had not suffered from it in 1851. The Baptists held an association here in the fall, and nearly every person who had not had the dengue previously, contracted it; but it did not develop itself until they returned to the country, and I never heard of an instance in which the disease was communicated (by those who contracted it here) to any person in the country.

I will here make a few remarks about *dengue.* It has occurred to me that there is a close analogy between it and yellow fever. This is shown in the violence of the attack, it being a disease of but one paroxysm; the intensity of the pains, the general expression of the patient, as red, wild eyes; flushed face, &c., and what attracted my attention particularly, was the hemorrhagic tendency,

especially among the females. In nearly all the females I treated, they suffered more or less on the subsidence of the disease from uterine hemorrhage.

1853. A few cases of typhoid, and hardly any other fever of any kind. On the 5th September, three gentlemen visited this place; two of them were from Galveston, and one from Harrisburg. They had been out from home ten days, and had left on account of the yellow fever, which was making great havoc in Galveston and Houston. They were all attacked at the hotel about the same time, of what I have no hesitancy in pronouncing *yellow fever*. They recovered soon, and the disease was not communicated to any person in the hotel.

On the 27th September I was called to see Mr. H., an Englishman, at 12 o'clock M. I found him profoundly comatose, breathing natural, pulse about 100 and weak, head and body hot, extremities quite cool, and bathed in cool perspiration. His wife informed me that he had complained for two days of great pains in his head and back; that on the day before I was called in he had gone out and finished a job; but that he complained very much when he returned at night, took no supper, slept little or none, but rose in the morning early; brought a bucket of water, seemed to be exhausted, fell down on the bed, and soon became quiet, and when she tried to get him to take some breakfast, she found him insensible. I found that our Episcopal minister had been with him some hours before I was called.

We did everything we could for him, but did not succeed in getting him out of the comatose state in which I found him until next morning, when he sat up in bed and talked rationally for three or four hours, when he relapsed into a comatose state, and died about 6 P. M. After death he was the yellowest cadaver I ever saw.

He had lived in the suburbs of the town, and hardly ever went out anywhere, but to his work and back home again; was a man of good habits, had been a resident of our place two years, and was uniformly healthy. Now, did this man contract the disease (if it was yellow fever that he died of) from an Englishman, Mr. B., and his wife, who told me that they both had had the disease in New Orleans a month or six weeks before Mr. H. was attacked? They came to Mr. H.'s house with some of their baggage, and occupied the same room with Mr. H. and family, eight or ten days before Mr. H. was attacked. After the death of Mr. H., his

widow and two children had a mild attack of a continued form of fever, but the disease spread no farther in this quarter, notwithstanding from two to half-a-dozen persons were constantly with the poor man, from the time I was called to him until he was buried.

October 1st, I was called to Mr. N. He occupied the first story of a brick house, the floor of which is laid on the ground. He used the room (say 50 by 25 feet), for a billiard and drinking saloon. Those who drank spirits at his bar were in the habit of tossing out spirits or water, &c., on the floor; this kept the earth under the floor constantly saturated with the refuse from his bar. He was in the habit of receiving ice every week from Houston, and of keeping it in his bar-room. It was moreover his custom to sleep during the day and sit up the principal part of the night; during the night the house was almost constantly closed, during which he breathed over and over again the noxious exhalations from beneath the floor, to say nothing of the deterioration the air of the room underwent from being crowded with a great number of persons drinking, smoking, &c. But to the case. He had a severe ague before I saw him, and was reacting when I reached him; was delirious; face very much flushed; eyes red and watery; pulse 110, strong and full; tongue moist, coated as with white paste: great irritability of the stomach. Suffice it to say, I treated him promptly; gave him the usual treatment for *yellow fever*, and had him in a good general perspiration in four hours; that he was almost without fever from the third day, and by the fifth had some return of appetite. But his nurse neglected him; a norther sprang up, he got chilled and relapsed, and came very near dying, but finally got well. Although he had not the least evidence of ptyalism, he had considerable hemorrhage from his gums, nose, and the blistered surfaces. Did he contract the disease from the blankets, sawdust, &c., in which the ice was enveloped? We had no other cases in town this fall.

1854. This year, with the exception of typhoid fever, and some other affections not worthy of note, was very healthy until the 5th of October, when I was called in consultation with Dr. Black to see Mr. G. He had unmistakable symptoms of yellow fever. He died on the fifth day with black vomit, and became very yellow after death. Before death he had hemorrhages from his gums, nose, and a blister over the epigastrium. He had not been to Houston or any other place where the disease was then prevailing, for several months.

10th October, I had two cases, Mr. L. and Mr. J. They both occupied the same part of the town in which Mr. G. passed most of his time during the day, and often until bedtime, viz., the house of Austin and Bertrand, a brick house, with a brick wareroom back, and immediately adjoining the building. The wareroom was at the time in a very leaky and filthy condition; not only so, but an extensive foundation was made but a short time before, for two large brick houses immediately adjoining the house of Austin and Bertrand. In digging out the foundation, a large quantity of earth was thrown out, it being about three feet to clay. The lot having laid vacant for eighteen or twenty years, and being about the centre of the town, and situated between two of the largest business houses in the place, it is but reasonable that a great quantity of impurities of one kind or other had percolated through the sand to the clay, and that when exposed those noxious exhalations from the earth would contaminate the atmosphere for some distance around. Be this as it may, at this spot the three first cases occurred.

October 17th, I was called to one case from Houston. I treated the case in the suburbs of the town; no member of the family nor any person that waited on the patient contracted the disease. Mr. B. contracted the disease here, and left for the West, and died on the fourth day of his illness, with black vomit.

30th October, one case. November 5th, three cases, two mulattoes and one negro. These cases occurred within twenty feet of Asutin and Bertrand's wareroom. 6th, our postmaster was attacked. 7th, his assistant; also Mrs. S. 8th, three cases. 10th, one case. 12th, norther; temperature 30°.—Of the above four died and three had black vomit.

I will bring this paper, which is already too long, to a close. But before doing so, I will state that yellow fever has prevailed more or less almost every year since 1839, in Houston; that our intercourse both by mail and otherwise has been almost daily, and that although we have had cases brought into our midst, repeatedly, the disease has never spread. Secondly; that as intermitting, remitting, and such affections have become less common, diseases entirely different from them have apparently come in their stead. Thirdly; that fevers identically the same that we suffered so much of, from 1837 until 1844, are very common within a few miles of this town, where persons are felling the forest and making farms, either in the Brazos bottoms, or in hammock land. Fourthly; that *dengue* did not prevail in any of the towns near this, in 1851 and

1852, although the places have all been built during the last nine or ten years; and in all of them they suffer considerably yet from the ordinary fevers of the country.

Then, is it not a fact, that in countries where the ordinary miasmatic fevers prevail to any considerable extent, just in proportion as men remove the influences that give rise to them, typhoid fever, *dengue*, and yellow fever become more common? In other words, that the causes of what are known as miasmatic fevers lie latent in our forests, &c., and man, in reducing the forest to a state of cultivation, renders those causes active; and after a few years those causes are either decomposed or dissipated by the direct rays of the sun, or swept away by the rain. Then, is it not reasonable, judging by the facts we have before us, that through the agency of man, causes are generated or developed which, when in sufficient concentration, will produce *dengue*, and typhoid fever, or when still more multiplied, will cause that great scourge of our country *yellow fever?*

Yours respectfully,

T. J. HEARD.

IX.—*Yellow Fever at Jeanerrett's, Parish of St. Mary, La.* By J. B. DUNGAN, M.D.

I was called on the 7th of October, 1854, to the house of Leon Frilot, f. m. c., five miles below New Iberia, to see a Jew peddler, Lazare Levi, unacolimated, eight months in the country. He was lying in a room at the north end of the back gallery. Had spent four days in Franklin; whilst in Franklin, had visited several times at the house of Solomon Levi, in whose family several cases of yellow fever had occurred, and one or two deaths. Came to Leon Frilot's on the 3d of October, was taken with fever on the morning of the 4th, and died on the 9th, of black vomit.

His cart had not been to Franklin, but was standing, previous to and during his illness, near the house. The goods in the cart had been bought (I was told) at some country store above St. Martinsville. He brought no goods from Franklin.

Immediately after his death the body was taken off for burial; the bed and bedding were burned; every article of furniture taken out of doors, the room washed, whitewashed, lime sprinkled on the floor, and left open and unoccupied for five or six weeks. A trunk of clothes belonging to Honoré, f. m. c., was under the bed during the illness of the peddler; after his death it was carried out,

opened and exposed to the sun for a few hours, and was then deposited in a room on the opposite or south end of the gallery, an open space intervening between the two rooms.

No case of sickness occurred in the family until the 29th of October, when I was called to see the wife of Alfred Olivier, f. m. c. This young woman was living in the family, but as soon as the peddler's case was pronounced yellow fever, she left the house and did not return until the 26th. She was taken sick on the 29th, had mild yellow fever, and recovered.

On the 30th, the wife of Leon Frilot sickened; had black vomit, and died on the 12th day of her illness.

On the same day, Leon sent his children with a negro boy about 12 years old to the house of his brother Aimé, about a mile distant on the opposite side of the Têche.

On the 31st, his daughter, aged 13, and the little negro boy, sickened with the fever. The former died on the third day with black vomit, and the latter recovered.

No cases of the fever occurred in Aimé's family.

Between the 1st and 22d of November eight or ten cases of the fever occurred among the free mulattoes at the house of Leon Frilot, and among the slaves belonging to the plantation, all of whom recovered, with the exception of Honoré, f. m. c., the owner of the trunk above alluded to.

Being absent myself, this man was seen on the 11th of November by Dr. Duperier, who considered the case one of yellow fever. I saw him after his death, on the 13th, at 9 P. M., and was shown about two quarts of bright florid blood which he had vomited shortly before his death. This man was intemperate, though previously enjoying good health; he was walking about most of the time until a few hours previous to his death, frequently throwing up blood. Whether he died of yellow fever or not I cannot say.

The last case of fever that occurred on the place assumed an intermittent form.

Dr. Duperier, who attended these cases in conjunction with myself, and during my absence of several days, had the fever and recovered.

Dr. Maguire called once to see the peddler, and again for a few minutes to see the cases of the free mulattoes. He was attacked on the same evening of the last visit, and after a serious illness recovered. The writer escaped, although he has never had yellow fever.

As to the locality in which these cases occurred, the house is

situated on a high, dry, and airy locality, on the west bank of the Têche, and disconnected with any other buildings except the kitchen, which is within a few feet of the house.

There were no local causes assignable for the origin and spread of the disease. The house, although old, is comfortable and airy, and the family as neat and cleanly in their habits as whites in the same circumstances.

The negro quarter is situated about fifty rods from the house, and contained twelve or fifteen head of negroes.

The surrounding plantations were remarkably healthy during the prevalence of the epidemic on that place.

Some cases of what the physicians called dengue had occurred at New Iberia, previously to the outburst of yellow fever on this place, but they were probably mild cases of yellow fever. But, so far as I could learn, this family had had no communication with that place.

I furnish the above facts without any comment.

P. S. The second case (Alfred Olivier's wife), during her absence from Leon's house, passed the time with one of the neighbors, and had no communication with any suspected locality.

X.—*Yellow Fever at Brandon, Mississippi, in* 1853 *and* 1854. By J. J. THORNTON, M. D.

[The following interesting letter will show how this disease broke out and prevailed at a village of about one thousand inhabitants, situated far in the interior of the country, and in a high piny-woods region. Dr. Thornton seems to think it attributable chiefly to *local influences*, though he admits that some of the first cases had been exposed in an infected district. A long and interesting account of this epidemic was published in the *Brandon Republican*, by Dr. W. Reber, in which the writer takes somewhat different grounds from Dr. Thornton. He admits the existence of extraordinary local conditions in Brandon when the epidemic appeared, but, at the same time, thinks much is due to intercourse with infected districts.—E. D. F.]

BRANDON, MI., Jan. 8th, 1855.

DR. E. D. FENNER—

DEAR SIR: I received your note and much valued present on last week, and, but for my engagements, should have replied sooner. I will now endeavor to give you a brief history, as you have re-

quested, of the fever of both 1853 and 1854. The first case that ever was seen in this place was R. L., æt. 20, a native of this State. He visited Jackson, as conductor on the cars, a week previous to taking the fever, which was on the 15th of September, 1853; had black vomit and turned yellow, and died on the seventh day of sickness. Quite a number of persons visited him and many lived in the same house and nursed him, yet there were no cases traceable to this as an infecting cause.

CASE 2. A negro, aged 30, taken Sept. 20th, discharged 27th; eyes very yellow. Three others were sleeping in the same room, but no other case occurred in the house, which is distant from the residence of the first case three hundred yards, one dwelling between.

CASE 3. D. E., aged 19, native of the State, taken Sept. 26th, discharged Oct. 4th, though he was several weeks in regaining his strength.

CASE 4. J. S., aged 17, taken Oct. 3d; came here two weeks previously from Jackson; died on the 8th. He had black vomit, and had large black discharges from the bowels; eyes were a little yellow, skin not, but congested at the clavicles. This case had no communication with either of the others. A negro boy was sick with intermittent fever in the same room and nursed him, but had no symptoms of yellow fever.

CASE 5. Dr. J. H. B., aged 29, taken Oct. 20th, died on the 26th. He had vomit of reddish flakes and turned yellow.

CASE 6. G. Mc., aged 31, taken 23d, well on 31st. In same house with fifth case.

CASE 7. C. V., aged 24, taken 26th, well in twelve days. In same house with two last cases; had nursed both; hemorrhage from gums and lips. Several whites and negroes nursed these cases; none were sick.

CASE 8. E. M., taken Oct. 24th, died on seventh day; was very yellow, and had black vomit. This patient was a native of Virginia; here twelve months; had not been to see any sick; was temperate and robust.

CASE 9. E. S., aged 50; taken Nov. 2d; turned yellow second day; had hemorrhage from gums; died the 7th; had black vomit. This man, a blacksmith, did not work within half a mile of any of the above cases, nor had he visited one; he slept out of town, and was temperate, not even using tobacco.

CASE 10. H. G., taken Nov. 4th; worked in the same house with

the above; wheelwright by trade. The shop was on the cut of the railroad, and there had been put near the shop, two years or more before, a great deal of sand from the cut. This sand washed down into a pond at the foot of the hill after every rain. The pond is some hundred and fifty yards west of the shop. H. G. lived adjoining the shop on the east. He died on the seventh or eighth day of illness; was yellow. No other case occurred in the house or shop, although five others were exposed.

CASE 11. W. S., aged 18, taken about this time. He slept in the same bed that E. M. (Case 8) was taken sick in, who had been removed to a distant part of the town when he died, no other case occurring there afterwards. W. S. was removed also from the store to the east of the town, and died on the sixth or seventh day with black vomit. One case occurred in the house, but recovered. This was the proprietor of the store where the two clerks (E. M. and W. S.) were taken, who spent most of the day there, sleeping at the house. Quite a large family lived in the house, but none took the disease, though many more were in the room than the proprietor, who did have it lightly.

There were other cases, but nothing either in type or locality to call for a description. In 1851 there were considerable changes made in the whole surface of our streets and many lots. A cut through the town, sixty-five feet deep and a quarter of a mile long, furnished dirt to fill up all washed places and to level streets, even to fill up valleys. The banks of the cut, as well as the dirt taken from it, have been constantly washing out and offering a new face at each rain. The cut is on the south of all the fever cases, but where they occurred there had been a deposit from the cut or a removal of the top soil.

1854. We had one of the healthiest summers and falls, till the first of October, 1854, that has ever been known in this town, and it remained healthy in the country around to the close of the year. We had a good deal of rain in the months of May and June, though not longer than a day and night at a time, soon drying up when the sun came out. The summer was not exceedingly hot, the thermometer not often getting as high as 90° in the shade. In August, the winds set in from the east and remained from that quarter most of the time till the middle of November, when north and west winds prevailed. The first case of yellow fever that occurred this year was a mile and a half southwest of town—taken about Sept. 23d, died on the ninth day of sickness, had black vomit two days

before he died; was very yellow—but, as his symptoms had been very mild for the first few days, and not being able to trace him to any place where fever had made its appearance, and as no case had yet been in Brandon—I for one was of the opinion that it was an aggravated, or perhaps mismanaged case of bilious remittent fever; no other case occurred at the plantation. There were some twenty on the place, black and white; some four or five acted as nurses: he was also visited by a good many persons, and *not one took the fever.*

CASE 2. W. B., aged 27; late from Michigan, taken sick Oct. 2d in Vicksburg, on his way to this place; arrived Tuesday; died on the sixth or seventh day of sickness.

Oct. 3d. Numerous cases now occurred, and chiefly in the north and west part of the town, where the dwellings were much crowded for a village. H. V. S. was taken, and, in quick succession, six other cases in the same house, two of which died. One had black vomit; nearly all got yellow, and had hemorrhage from some part of the mucous membrane. The next house on the west had three light cases, two whites. A negro man was removed half a mile south; also recovered. The next house had four cases, three whites and a mulatto woman; all got well. The next house was north-west—had no case to originate in it, but I had a case moved there which died. No other in the house, although some eight or ten black and white were there till his death. No black vomit and no yellowness; yet as well-marked a case as I saw, in other respects. Had bleeding from gums, and his arm broke out afresh after my having bled him some eight hours previous.

The next house north of this had three cases; all died. One, a relapse case, having had the disease the first or second week in October, relapsed two weeks after and died. He was thought by his physician to have had the fever last year (1853). I did not see him last year, but I saw his first attack this year, and did not believe he had it. All the cases here mentioned were the most temperate and least exposed of our citizens, excepting the cases that came on a little before and at the same time with theirs.

The next case was dissipated; had a light attack; was well in seven days.

About this time, some ten or more negroes were attacked in and around the public square, the scene of extensive grading and filling, which is to the east of nearly all the cases; none of the negroes died, none had black vomit; some other cases came on about No-

vember, and lasted till the 17th or 18th. Some few died, but most recovered.

The disease was confined to the region of town west and a little south of the grading, which has been extensive the past year, chiefly done in July and August. This, taken in connection with the vast railroad cut and exposure of the dirt taken from it, I think, furnish a *local* cause sufficient, without looking further. That it was *not contagious* I am satisfied, from these facts—whenever a case, taken in town, was removed to the country, or just out in the environs, it was more liable to get well; and even if it died, no other case occurred either in the same house or neighborhood. Secondly, even in the locality where, *I believe*, it originated, no nurse or physician took the fever; while, at the same time, those who lived here and slept here took the disease.

Had it been *infectious*, there were goods just in from New Orleans, and being opened; yet no case occurred in those stores, and only one in any store, and that house purchased goods in New York.

There was but one nurse who took the disease, and he was an Irishman who had been here some fifteen years, and slept in the district southwest of the Grading, at the head of a hollow which conducted the easterly wind freely into his bedroom. But one nurse had had the fever last year, and that one had symptoms of the disease again this year.

A hue and cry was made about the cars running to town from Jackson, on the plea that they introduced the disease shut up in them; still, no railroad hand, clerk, or deputy took the disease at all till the disease was nearly gone from among us, and he, a negro, had been sick with chills, rode ten miles at night in the stage to see his wife, and sent for me next day. He then had yellow fever, and recovered on the seventh day. This case was sick in the house occupied by forty negroes, men, women, and children, not one of whom had ever had it, nor did one take it.

My treatment was simple. In the outset, to open the bowels, which were usually costive; I gave oil, calomel, salts, or compound cathartic pill, either one. The stools were always the same, no matter which was used, dark, bilious, and fetid. Warm teas or cold drinks and ice; hot foot-baths, enemas, and sponging with hop-tea and brandy; blisters and the emulsion with creasote; for sick stomach, ale, brandy, champagne—in fact, the least treatment the better, only to keep the patient as comfortable as possible.

Dear Sir: I have thus hastily tried to give a correct narrative of

facts, and given my views in few words. Time does not permit of my looking over this to make corrections of any kind. Take the above history for what it is worth; you, perhaps, can find and collate the useful, if there be any. Respectfully,

J. J. THORNTON.

XI.—*Yellow Fever at the Village of Cloutierville, La., in the years* 1853 *and* 1854. By S. O. SCRUGGS, M. D.

[The following remarkable letter will doubtless be read with interest. It is to be regretted that the writer did not state more distinctly his method of giving the *sulphate of iron* in yellow fever before he began to prescribe the *muriated tincture*. The results of his heroic doses of the latter medicine are certainly very remarkable. I also received a letter from Dr. W. H. M'Craven, of Galveston, Texas, giving some very happy results obtained from the muriated tincture of iron in yellow fever, but do not feel fully authorized to publish it. Dr. Scruggs gives some striking facts, showing the transportability and infectiousness of yellow fever. The village of Cloutierville is situated on or near Red River, between Alexandria and Shreveport.—E. D. F.]

CLOUTIERVILLE, LA., April 6, 1855.

DR. E. D. FENNER—

DEAR SIR: I have just reached home, and, in compliance with your request, hasten to give you the information you desired.

The first case of yellow fever, out of the city of New Orleans, that occurred in the little village of Cloutierville, near which I reside, was on the 14th of August, 1853. I was called to it on the afternoon of the second day, and pronounced it, unhesitatingly, *typhus;* predicating my opinion not only upon the symptoms presented, which were decidedly of that character, but from the fact that the case was in a room ten by fourteen feet square, in which *eleven human beings* (Germans, and not remarkably cleanly) were living, with but a small window and contracted portal to ventilate the meagre apartment. The next morning, without my knowledge, the patient was removed to the garret of the building, to be, as his friends informed me, a little more comfortable. I found him sitting up in bed, and asked him how he felt. He replied to me in German, as he spoke neither English nor French, that he was better as to his headache, but that he was very thirsty. Upon examination, I found his condition pretty much the same as the day before, only a greater degree of turgescence of the face. I left him, and returned on the next

morning at 10 o'clock, and found him extremely restless. I made the same inquiry, as to how he felt, as I had done the day before, but he made no reply. I placed my finger upon his pulse, but had scarcely touched it when, with a convulsive motion, he ejected a volume of black vomit over my entire person, which showed the more prominently from the fact that I was clad in white vest and pants. As a matter of course, it flashed upon me at once that my patient had the yellow fever, and *not* typhus, as I had diagnosed when I first saw him. Descending below, I made inquiry of his friends how long he had been from New Orleans, and was informed that it had been *four months*. This announcement staggered me for a moment, and without reflection, I concluded that it was *sporadic*.

In the afternoon of the same day I returned to the house to ask how long it had been since their goods were opened, and by whom they were opened, and how long since the goods had been shipped from New Orleans; and was informed that my patient first opened them, assisted by Frank and Kohn, about ten days before, and that it had been fifteen days since the goods were packed in the city, and that the *three* who had gone down to purchase had each perished with yellow fever. My patient died shortly after I left the house, and knowing as I did how fearfully the epidemic was raging in your city, it occurred to me that the disease *might have been brought up the country in those goods*, although the contagion of yellow fever had been so often denied by those of the profession whose peculiar locations had given them ample opportunities of investigation. It was not long, however, before I became convinced that the disease had been *imported* in those goods, and that yellow fever was an *infectious* disease; and, before I conclude, I will present you the grounds upon which I predicate my opinion.

Had no other case occurred but the one I have recorded, I should have regarded it simply in a sporadic light, and have thought but little more about it; but the disease, in a very short time, assumed a most malignant and desolating form. At the time that the first case occurred, there were *ninety-one* inhabitants of the town, but before the disease abated *sixty-eight* died, the first *three* of whom were the *very three* who opened the boxes of goods but a few days before. Some twelve days after the death of the first case I fell myself, and was unable to perform any duty until the 2d of October, and, as a consequence, I am unable to tell you what took place during the time I was confined to my bed, more than that upwards of fifty

died. The epidemic continued in the surrounding country until the 14th of December.

Now, as to its contagion, or rather *infection*. In the first place Cloutierville is isolated in a very great degree, being located upon *La Riviere aux Cannes*, or Cane River, a portion of Red River, that is navigable for boats but a few months in the year, and particularly in the year 1853, there had not been a steamboat at her landing for more *than six weeks*. Now, is it probable that a disease like the yellow fever should have developed itself *naturally* in our midst, decimating the village and desolating the country, when not one of the causes of its production exists? Why is it that this ill-fated little village has never been visited before by yellow fever, when nearly every other town where steamboats ply during the prevalence of the disease in New Orleans has been attacked by it? The disease has visited Alexandria and Natchitoches more than once, and it is strange to me that they do not have it oftener, particularly Alexandria, where the steamboats are constantly landing. I certainly know of no local cause for yellow fever in and about Cloutierville. My plantation and that of Mr. A. Lecompt surrounds it, and neither of us have a lagoon or lake upon our respective places, nor is there a marsh in any direction contiguous to the village. Where, then, did the terrible disease have its origin in 1853, but in those identical goods? How did it happen that the disease was confined at first to the very spot, and the only one from which we can fix a cause for its appearance? And why is it that the first three who had it and died were the same *three* who were engaged in opening the goods purchased but ten or fifteen days before in the city of New Orleans, and in a store where all the inmates save one died, together with the three purchasers of the goods who resided in Cloutierville, and that, too, during the prevalence of the most fatal yellow fever epidemic with which your unfortunate city was ever cursed? What does such evidence teach us? But, again, shortly after my recovery, I was upon a visit to a friend some twenty-five miles from my home, when I was requested by the physician of my friend's family to visit with him a case he had in the pine woods, a distance of about four miles, which, he said, presented some peculiar characteristics. I did so, and pronounced it yellow fever. As well as I now remember, the patient was a German peddler, and died the next day after I saw him, with black vomit. The family, at whose humble, but hospitable mansion the poor stranger had fallen a victim, consisted, I think, of five; *four* of

whom died within fourteen days of the German, *and not another case occurred in the neighborhood.* The German evidently contracted the disease in the town of Natchitoches. Now, sir, here we have black vomit occurring in the pine woods, in an individual who had been where the disease was raging; and an entire family destroyed by the *same* disease; yet neither of them had been within twenty miles of the disease in any direction, nor ever saw yellow fever until the poor peddler *brought it* in their midst. How did they get yellow fever? Why did not their neighbors have it? Why, simply because I proclaimed to all that the disease was *infectious*, and that by cutting off all communication we would be enabled, as Dr. Rush remarked in 1793, to "pen up the disease like a mad bull." Can any rational mind doubt for a moment that, if the poor German had never gone to that house, that the yellow fever would have ever desolated it?

The above instance, added to that of the goods in my own village, fortified my opinion that the disease was infectious, and had it not, two other circumstances which I will detail, were

"——— confirmation strong
As proofs of Holy Writ"

that it was emphatically so. On the opposite side of Red River proper, commonly called the Bon Dieu, a kind of neighborhood quarantine had been kept up in the pine woods, during the prevalence of the epidemic in Cloutierville, and no one was allowed to pass within a certain distance of one of the houses.[1] One of the neighbors *whilst on guard* met with a woodcutter who had been to Alexandria, but who *said* he had been for two days at the house of a gentleman some twelve miles distant. The man told him to go on to the house, that he would be on himself after awhile. That very night the wood-chopper was taken with a chill, and in five days died with black vomit. All the neighbors, believing that it was nothing more than a simple case of fever, as he had been nowhere to catch the "black vomit," visited him, and, in twenty days afterwards, there was but *one* left among all who resided in the neighborhood to tell the tale of the fearful ravages of the disease. The wood-chopper had been living there for years, and was working for them at the commencement of the epidemic at Cloutierville. Now, how did the wood-chopper get the disease? Why

[1] Nearly all who reside on that side of the river live by cutting and selling wood to the steamboats.

he caught it in Alexandria. Well, how did the Perkins neighborhood get it, if it was not conveyed there by the laborer above mentioned? It could not have been carried there in any other way. A German peddler died about twelve miles from me, early in the epidemic, and the room in which he died was immediately closed. Some days afterwards, some friends of the family who occupied the house, arrived from Texas, and rather than put them in the bed where the peddler died, a young man of the family took it himself, and in eleven days afterwards he died of black vomit, and several others in the family were very ill. Now, it is very true, this family were very poor and filthy, and the young man slept in the *very* bed in which the peddler died, without its having been changed; but does not this very fact go as additional evidence to prove that the disease is infectious? I could multiply instances, but it is unnecessary. I have given you what I *know* to be facts, not what I *heard*.

I come now to speak of my treatment, but especially the iron treatment. Early in the fall of 1853, or at least it was after the epidemic had been raging for some time in your city, that I stated, in a letter addressed to my lamented relative of Shreveport, Dr. R. L. Scruggs, that if ever I found an opportunity to treat yellow fever, I would not hesitate as to the remedy, and that remedy would be the pure chrys. sulph. ferri, an article for whose use I am indebted to my old personal friend, Dr. Robert Gayle, of your city, not in yellow fever, however, but in enlarged spleen.

The first case I visited after my recovery was that of a particular friend. At the house of this friend, I will here remark, *en passant*, there was a stranger sick with yellow fever, and who was being treated by a French physician.

A servant was just coming out of the sick man's chamber with a vessel of blood. Upon inquiry, I found out that the stranger had then been *bled for the fourth time*. It is useless for me to say to you that he died, together with *twenty-eight* others, under the lancet practice of the scientific French doctor. I mention this merely from the fact, that seeing the blood from the arm of the stranger, whom *curiosity* prompted me to look at, in going out of the house, but settled my conviction as to the iron remedy.

To my friend I administered the iron and departed to visit three other patients, to all of whom I gave the same prescription. The following morning I visited them all, and found them doing better

than I had any right to expect. I continued the iron and they all recovered. I did not lose a case after that out of upwards of forty.

The following summer, 1854, the epidemic again made its appearance in my neighborhood, but I was absent from home, and, unfortunately, had not *here* an opportunity of trying the relative value of the pure sulphate, and the mur. tinct. ferri which I greatly desired.

During my voyage, however, I had a fine opportunity to test the tincture on board the steamboat upon which I ascended to St. Louis. The Mississippi was remarkably low and the boat heavily laden; and as a consequence, the trip up was a long and tedious one. Several cases of yellow fever occurred on board, all of which I treated with the tincture, and entirely successfully. My prescription was generally sixty minims every three hours, until eight doses were taken.

Four days before my arrival at St. Louis, my servant, a very intelligent fellow, took the disease. I prepared in a tumbler half an ounce of the tincture to four tablespoonfuls of water, giving him *one dose only*, intending to repeat it in the several periods of three hours; but being indisposed myself, I gave him my watch, stating to him that if I did not come in again in three hours he must take another tablespoonful of the mixture. I did not return but *once*, and that was too early for a repetition of the dose, but on my second visit, I found to my utter astonishment and alarm, that he had, instead of *one* tablespoonful, taken the entire quantity at one dose. I immediately asked him how long it had been since he took the potion; he replied "about an hour." I placed my finger upon his wrist, and found his skin moist, and his pulse, so far from an unusual excitement, had actually fallen from 121 to 102 during the interval of my last visit. In four hours more he had but little febrile excitement, and recovered rapidly. I would remark that he was very active in his attentions to the other cases which occurred on the boat during the voyage.

This one isolated case proves *one*, if not *two* things, viz: that if the muriated tincture of iron is not a proper remedy in yellow fever, there is but little harm in the administration of it in heroic doses.

Upon my return home, I was summoned as a witness in court, a distance of some thirty miles from my residence. Whilst there, a neighbor requested me to get permission from the judge, for a day only, that I might visit his hospital. I did so, paid the visit, and

found two *griffe* servants, as I believed at the time, beyond all hopes of recovery. I ordered, as a dernier resort (having the case of my servant as a precedent), the following heroic prescription: Tinct. ferri muriat. ℥ij; aqua fontis ℥vj; M. One ounce of which to be given to each every *two* hours. I left immediately, requesting my friend to inform me of the result of my medicine, intimating to him at the same time, that *when they died* I would be pleased to examine them. Confined as I was as a witness in court, I did not hear from my patients for four days, when, to my utter astonishment, I learned that they were both recovering. They *did* recover, and are now well, and working as usual with the other negroes. These last two cases are all that I treated so valiantly, and whether they recovered in *spite* of my physic, or by its potential influence, the Omniscient only knows.

Did you remark a peculiarity in regard to females, that, so soon as the attack came on, the menses made their appearance also, although they may have just passed naturally? In nearly every instance, up here, such was the fact. May this circumstance, from the peculiar condition in which the blood of yellow fever is always found, not throw some light upon the long vexed question of the menstrual discharge? I hope I shall hear from you soon.

There is a circumstance (which, I think, deserves a passing notice) connected with the two epidemics of this region of country, that is certainly somewhat singular. Above me, about six miles, there is a large population of free colored people. During 1853 *not one* of them had yellow fever. Yet in 1854 the disease was confined almost entirely to them, and but one white person died, or even had it, who resided in the neighborhood, and who did not have it during the prevalence of the epidemic.

I have thus, sir, in a rapid and hurried manner, complied with your request. Hoping that the inaccuracies consequent upon hurried composition may receive a charitable consideration at your hands, I remain

Yours, truly,

SAMUEL O. SCRUGGS.

[The subjoined sketch of the yellow fever at Norfolk and Portsmouth was received in connection with the previous papers of the Appendix, and although it forms no part of the Report presented by Dr. Fenner to the Association, yet its interest and value will, in the opinion of the Committee, be regarded as an adequate reason for introducing it in this place.—COM. OF PUB.]

ON THE YELLOW FEVER OF NORFOLK AND PORTSMOUTH, VA.[1]

BY E. D. FENNER, M. D.

Some of your readers may be at a loss to discover an object sufficient to induce a practising physician of New Orleans to leave his own city, in the midst of an epidemic, and go abroad in search of a disease which for some years past has committed such dreadful havoc among the people of his immediate vicinity; and the same in respect to others, both acclimated and unacclimated, who, on hearing the cry of alarm and distress that went forth from Norfolk and Portsmouth, went not only from places where yellow fever is a common disease, but from many others, where it is either unknown, or has not prevailed in their day. I will endeavor to satisfy these searchers into human motives, for I deem the inquiry a very natural one.

I will say, then, that some were employed for the purpose and liberally compensated by their benevolent fellow-citizens at home. These were selected for their capacity and experience. Others, likewise experienced and acclimated, hastened to the scene of distress, and cheerfully volunteered their services to the sufferers of every class. Whilst others, of bolder daring still, who had never either seen or suffered the disease, rushed into the midst of the pestilence, and, reckless of personal danger, begged the privilege of doing whatever they could to relieve their dying fellow-beings. How this latter class sacrificed themselves in the cause of suffering humanity, and how the others performed the duties assigned to or assumed by them, is not for me, but for the surviving citizens of Norfolk and Portsmouth, to say. Such, at least, were the leading motives, as far as I could judge, of the physicians from abroad who visited these places in the late epidemic. For myself, besides a desire to do some good, if it were in my power, I wished to see yellow fever at a different place from New Orleans, where I had observed it closely for the last fourteen summers; and, as I remained at home until our

[1] From the New Orleans Medical and Surgical Journal, November, 1855.

epidemic had reached its maximum, I knew that my services could well be spared for the rest of the season.

It is not my purpose, on the present occasion, to attempt to furnish you a full account of this epidemic, but only to make a few remarks upon some of its more prominent features and incidents.

Long before reaching Portsmouth and Norfolk, we met the most frightful rumors of their sufferings, and when we arrived there appeared to be but little exaggeration in these flying reports. The stores were all closed, all the workshops were silenced, and the only appearance of activity visible was in the hurried movement of physicians' vehicles, and of persons in pursuit of medical aid and comforts for the sick. It was thought that more than half of the inhabitants of both places had fled from the impending danger, and I was truly glad to hear it, for I am well convinced that in occasional outbreaks of yellow fever the greatest safety will be found in flying from the infected district. In this instance, nearly all that remained were in continued apprehension of attack, for there were probably not a dozen persons in both places who were secure by having had the disease previously. Many had occasion to regret that they did not make an early retreat, and some went too late; they were attacked in other places, and, almost without an exception, fell victims.

When Dr. Beard and I arrived at Norfolk, we found the epidemic raging with terrific violence, and increasing from day to day. Some of the resident physicians were already down with the fever, two or three had died, and the rest were doing more labor than human nature could stand for any great length of time. Not a single one of them was acclimated, and therefore they all expected to be attacked sooner or later. Yet they stood their ground like true heroes, resolved to stand or fall at the post of duty. What rendered the case of these gentlemen worthy of more special sympathy and admiration was the fact that their devoted wives could not be persuaded to leave them, but determined to remain and share their danger.

How great these dangers were, may be learned from the fact that more than two-thirds of the resident physicians have fallen victims, and the others have narrowly escaped with their lives.

At the time of our arrival, it was impossible for the medical force in attendance to do justice to the sick, and the disease was spreading so rapidly that the heart sickens at the contemplation of the state of things that must have come about, but for the valuable aid of

various kinds that came pouring in from almost every section of the Union. But for these immense contributions in the way of money, provisions, physicians, nurses, medicines, coffins, &c., the citizens would soon have been unable to attend their sick and bury their dead, and all who were able would have been compelled to fly away and leave their city in sole possession of putrefying corpses. Even with the assistance that came, it was found difficult at one time to get the dead buried, and a few corpses remained out of the ground as long as thirty-six or forty-eight hours.

When we got there we found one New Orleans physician, Dr. Penniston, already on the ground and doing immense labor. Dr. Stone had been there, but was only able to remain a few days. In a short time we had an ample medical corps, consisting of physicians from New Orleans, Mobile, Charleston, Savannah, Philadelphia, Baltimore, Richmond, and sundry other places, who, in connection with the resident physicians still moving, were able to visit the sick as often as necessary. Nurses, too, came from all the places first mentioned, and others, some of whom unfortunately were but illy prepared to meet the danger they voluntarily encountered. Like the unacclimated physicians, many of them suffered severely from the epidemic, and some fell victims. At one time New Orleans had fifty nurses in Norfolk and Portsmouth, employed at the rate of sixty dollars a month; and Charleston sent forty, at forty dollars a month.

My own observations were confined to the city of Norfolk, with the exception of a single visit to the U. S. Naval Hospital at Portsmouth, a magnificent establishment in charge of surgeon Minor, which, by order of Government, was opened for the general admission of yellow fever patients. There I saw some forty or fifty patients in different stages of the disease. A temporary hospital had been established some three or four miles from Norfolk, but it was found to be too inconvenient of access. The new Howard Infirmary, established in the heart of the city after our arrival, was found to be very serviceable.

The impression made on my mind by the first cases I saw of this epidemic, was that it was of a mild type, and ought not to prove very fatal if properly managed. Indeed, the first seven or eight cases I took charge of, yielded very readily to a mild course of treatment; but it was not long before I discovered that the tendency to death in apparently mild cases, or those marked by no violent symptoms whatever, was much stronger than I had supposed. In some of the cases the approach of the disease was very gentle, there

being nothing observable but a sense of fatigue, little headache, and slight feverishness. Indeed, the person would be in doubt whether he had the disease or not, and perhaps send for a physician to decide the question for him. A few hours would be sufficient to settle it, and he would then go on with symptoms somewhat better marked, but still not at all distressing. If asked how he felt, he generally replied "*pretty well*," or "*very well*." The system appeared to respond readily to moderate doses of medicine; every function seemed to be going on well, and the prognosis would be thought favorable until the approach of the critical period, the end of the third day. Then, if the case were going to terminate badly, there would appear eructations and acidity of the stomach, suppression of the urine, slight delirium and restlessness, and the patient would go into fatal black vomit and coma, in spite of anything that could be done for him. This unfavorable change would often take place most unexpectedly, and without the commission of any imprudence whatever. Such were the cases of Mr. Cunningham, editor of the *Norfolk Beacon*, and Mr. W. D. Roberts, a member elect of the Virginia Legislature. Each of them had mild attacks, and went on as quietly as possible for yellow fever patients till the close of the third day, when suppression of urine and other fatal symptoms appeared, and they sunk unconscious and almost without a struggle. Mr. R. threw up black vomit copiously. They were each about fifty years of age, and it was a remarkable fact, that but few persons of this age or beyond, recovered from this epidemic.

In many of these mild attacks, the skin acted finely till the third day, when it would become dry, and very soon be followed by restlessness and other bad symptoms; in others it was difficult to keep up a steady perspiration. The skin would not be very hot, nor was it difficult to start a perspiration, but it would soon cease, and there was a constant tendency to dryness. This symptom was generally unfavorable, but when accompanied by a loose state of the bowels, I regarded it as very much so.

I have mentioned particularly these gentle attacks and apparently mild cases with the view to show the strong tendency to death that often existed when there were no urgent or distressing symptoms to give warning, thus too often blasting the fond hope and anticipation of physicians and friends; but it is not to be denied, that in the majority of cases, the attack was open and bold enough, yet not sufficiently so to demand the use of cups or the lancet as often as we see in New Orleans.

The disease appeared to become more malignant as the season advanced, as was shown by the greater number of deaths in proportion to attacks, and this was observed up to about the 27th of September, when the epidemic rather suddenly declined, without the appearance of frost or storm, or any extraordinary change in the weather. Such, you know, was the case in our great epidemic of 1853.

I have often been asked the question whether in Norfolk the epidemic was not more malignant and in other respects different from any that has prevailed in New Orleans. In reply, I could not say that it was. I saw no peculiar symptom or variety of the disease that I had not often witnessed in New Orleans; yet there may have been a difference in the relative frequency or combination of certain symptoms which would characterize this epidemic as being somewhat different from all others, inasmuch as we never see two epidemics precisely alike, even in the same locality. The malignancy of an epidemic is generally estimated by the mortality it causes; and in this respect a search into the records of yellow fever will show that the late mortality at Norfolk and Portsmouth, although very great, does not stand unrivalled. An estimate of this, however, can only be formed after we obtain a report of the number of persons exposed to the disease, the number attacked, and the total deaths, for which we will have to look to the physicians and authorities of Norfolk and Portsmouth.

Let us now take a glance at some of the more prominent features of this memorable epidemic.

It is well known that suppression of urine is a symptom of not unfrequent occurrence in yellow fever, and is generally considered a very bad symptom. I think it was more common in this epidemic than any I have ever witnessed, and was always of very serious import. In some few instances the secretion of urine was restored after being reduced to an exceedingly small quantity for twenty-four hours or longer, but where there was a *total suppression* for this length of time, I believe it was as rare to witness recovery as from the worst form of black vomit. Nor am I aware of anything that can be confidently relied on to restore this function when completely suspended. I have known the flow of urine to be increased after having been reduced very low, and always viewed it as a favorable omen, but am by no means sure that the beneficial change was justly due to the use of turpentine, nitre, gin, or any other

diuretic. I am not inclined to believe that the suppression arises from any material change in the substance of the kidneys; none at least has been as yet satisfactorily demonstrated by post-mortem examinations. It seems to me that it must depend upon the morbid condition of the blood and the nervous system. Be it as it may, this symptom was certainly much more common at Norfolk than in the great epidemic of 1853 at New Orleans.

In respect to *hemorrhages*, the grand characteristic feature of yellow fever, almost every variety was witnessed at Norfolk, such as from the nose, mouth, stomach, bowels, uterus, scrotum, blistered surfaces, &c. In accordance with my observation at New Orleans, these hemorrhages were of different import, according to their seat. When hemorrhage began at the nose, gums, or uterus, it appeared to be a *critical* discharge, and was most generally followed by a salutary change in the condition of the patient; but when it began at the stomach, it made what is generally known as *black vomit*, a symptom that still holds its long established position as one of the most dangerous that attends this terrible disease. Black vomit was exceedingly common in this epidemic, and, what is worthy of remark, there were numerous recoveries from it. I hardly conversed with a single physician who did not tell me of having seen one or more recoveries from this usually fatal symptom. The day I left Norfolk and was coming up James River, I had the pleasure of falling in with an interesting young lady, about thirteen years of age, the daughter of Capt. Whittle, of the Navy, whom I had treated in the epidemic. She had thrown up black vomit for forty-eight hours, but recovered from it, and then stood before me in perfect health.

Recovery from black vomit was most common to the youthful, but several instances were seen amongst persons of more advanced age.

In some cases the attack was ushered in with bilious vomitings; otherwise the symptoms throughout were not of a violent character, yet the case was very apt to terminate fatally. Some writers contend, as you are aware, that bilious vomitings are never met with at the onset of yellow fever, but my observation teaches me differently.

Some of the most obstinate cases of this epidemic were marked by an almost perfectly *natural* tongue.

I met with several cases in which severe hunger was a prominent symptom. They were very apt to terminate fatally.

The negroes of Norfolk suffered severely from this epidemic, though not so much as the whites. The disease seemed to affect them pretty much as it does in Louisiana, and wherever there was any mixture of white blood amongst them, its effects were more severe. The bright mulatto will have yellow fever almost as severely as the pure white. From what I could learn, there were more deaths among the blacks of Norfolk than have ever occurred in an epidemic at New Orleans.

Relapses were not unfrequent, and were generally dangerous.

I knew several instances of second attack in persons who had had the disease previously at other places, but generally after intervals of ten or fifteen years, in which there had been no exposure to the disease. Nothing short of thorough acclimation afforded protection against this epidemic.

In respect to *treatment*, I believe I have nothing new to offer, or anything that is worth inserting in your journal. Amongst so many physicians collected together from different places, and having views and opinions derived from such different sources, of course you would expect to find quite a variety of treatment. Such was the case at Norfolk. Of one thing I am pretty certain, the mortality was large under any treatment I saw pursued. Either the disease was *unusually malignant* or the constitutions of the people had *less capacity for resisting its assaults*. They seemed to sink more readily under its deleterious effects; to die with milder and less formidable looking symptoms than I ever witnessed before. Somehow or other the people of New Orleans make a better fight against yellow fever than did the citizens of Norfolk. It has been observed, however, that whenever yellow fever epidemics prevail in more northern latitudes the mortality is very great. For myself, I recommended and used a mild course of treatment at Norfolk. I did not try to cut short and *cure* the disease, but rather to guide the patient through its natural stages. I thought I saw injurious effects from *over-medication*, but it was notorious that the opposite or *do-nothing* system of the homœopaths was signally unsuccessful; and then the survivors appeared to feel that their friends had been lost without a fair struggle against the destroying enemy.

A remark or two about the mortality and supposed origin of this terrible epidemic must close this communication.

Dr. N. C. Whitehead, the acting Mayor of Norfolk, in a letter to the visiting physicians when they were about to depart to their

respective homes, at the close of the epidemic, estimates the average population of the place during the pestilence at about 6,000, and the number of deaths at 2,000. I think these estimates will prove to be somewhat erroneous, and that the number of deaths most probably did not exceed 1600.

A complete census of the 3d ward was taken by the Relief Committee, which furnished the following statistics:—

Population—whites, 638; colored, 558; total, 1,196.

Fever cases—whites, 579; colored, 213; total, 792, or two-thirds of the inhabitants.

Deaths—whites, 159; colored, 13; total, 172, or 21.70 per cent. of the attacked.

This is one of the largest wards in the city. The mortality at the new Howard Infirmary, and also at the U. S. Naval Hospital, was about 35 per cent., or 1 in 2.80 of the admissions.

About 70 physicians and second course medical students went to the assistance of Norfolk and Portsmouth, of whom 21 died.

I am not prepared to admit that this epidemic was at all more malignant than that of New Orleans in 1853, though the mortality may have been somewhat greater in proportion to the attacks, from the depressing influence of panic and the want of proper nursing, which was severely felt at the beginning.

As for the *origin* of the epidemic, it must remain shrouded in doubt until all the facts and circumstances attending its commencement are fully reported. But two sources are looked to by common consent: it must have originated either from a local cause, in connection with a peculiar constitution of the atmosphere around, or from a morbific germ imported by the steamship Ben Franklin. That it may have originated from the former, would appear probable, from the fact that three cases of yellow fever occurred last year in Norfolk, and at the very spot where the epidemic of that city commenced this year. This was the celebrated Barry's Row, which was burned down this year. These cases occurred late in the season, and were not traceable to any foreign connection. In 1852, there were also several well-marked cases of yellow fever in Norfolk, likewise apparently of local origin. I was also informed that some cases very much like yellow fever, though perhaps not unquestionably, were observed this year simultaneously with the first cases on board the Ben Franklin. But, on the other hand, it is certainly true that the epidemic appeared to commence at the spot

where the Ben Franklin laid, which was at Gosport, and from there spread progressively over Portsmouth and Norfolk.

Now, let us look to the behavior of the ship Ben Franklin. She arrived on the 6th of June from the island of St. Thomas; was examined by the health officer, Dr. Gordon, on the 7th, and, although she was found to be perfectly clean and free from disease, she was ordered to undergo quarantine, because she had come from a *suspected* port. During her late voyage, two deaths had occurred on board; one a fireman, who died of disease of the heart, and the other a sailor, who was put in his place, and sank from exhaustion, being unaccustomed to the employment. On the 19th of June the vessel was released from quarantine, at the instance of the Board of Health of Norfolk, no case of sickness having occurred during her detention, notwithstanding the employment of a *new crew* on the day after her arrival. The vessel was then taken up to Gosport for repairs, and remained there until July 8, eighteen days after she had been released from quarantine, when the authorities of Portsmouth ordered her off, on account of the occurrence of a case of yellow fever that was thought to be traceable to the vessel. She again returned to quarantine ground. On the 12th, she was examined by Dr. Schoolfield, on behalf of the Portsmouth Common Council, and was found to be perfectly clean and healthy. On the 13th, these parties addressed a note to the health officer, stating these facts, and consenting to release the vessel from quarantine again. On this day Dr. Gordon visited her, and found a suspicious case of fever on board, which caused him to detain her till the morrow. He then visited her again, and found two more cases, which he pronounced to be yellow fever. From that time and place the disease continued to spread till it resulted in the terrific epidemic that has caused such desolation in both cities. Such is a brief summary of the facts relative to the ship Ben Franklin, obtained from authentic documents, and published by a correspondent of the *Richmond Whig*. Now, if three cases of yellow fever originated from local causes at Norfolk in 1854, and a greater number of cases in like manner in 1852; and, furthermore, if one or more cases were seen about Norfolk and Gosport at the time or previous to the first case that occurred on the Ben Franklin, and having no connection with that vessel, as I heard reported, there is certainly much room to doubt whether this epidemic arose from an imported infection.

It is hoped that all the facts attending the origin of this memorable epidemic will be authentically reported at an early day.

There is one important point, on which, I believe, there is a general concurrence of testimony, which is, that this disease was neither contagious nor infectious beyond the limits of Norfolk and Portsmouth. Numerous cases were carried to Baltimore, Richmond, Petersburg, and various other places, and in not a single instance was it communicated to persons coming in contact.

REPORT

ON THE

METEOROLOGY, MORTALITY, AND SANITARY CONDITION OF NEW ORLEANS,

FOR THE

YEARS 1854 AND 1855.

BY

E. H. BARTON, A.M., M.D.

REPORT ON THE METEOROLOGY, MORTALITY, AND SANITARY CONDITION OF NEW ORLEANS, FOR THE YEARS 1854 AND 1855.[1]

PART I.—1854.

THE year was as remarkable for the distribution of its climatic elements, as for some of its extremes.

TEMPERATURE.—In relation to this, February was two degrees cooler than the average.

I state it as a very unusual fact that April was cooler than March, by nearly three degrees! It was also in every sense drier, and the mortality was consequently less by near 150.

July was two degrees warmer than the average, and the extremes in the latter part of June and in July, were almost unprecedented. Ninety-five degrees were reached several times; a very remarkable height here, in a fair exposure.

Again, September was two degrees warmer than the average.

November was three degrees cooler.

December more than six degrees cooler than the average; tending to make the entire year about one and a half degrees cooler than the average.

SOLAR RADIATION was, as in every sickly year, also higher than usual.

In relation to the DEW-POINT.—During March it was nearly ten degrees higher than the average, and during April seven degrees

[1] It is proper to state that this report was prepared for and read before the New Orleans Academy of Sciences, but as it embraces topics fairly within the scope of our committees on epidemics, I see no impropriety in accepting it as a contribution to our volume. Indeed, I cannot doubt that the Association will be duly grateful to Dr. Barton for the valuable service he has done us. Of course the report will stand upon its own merit, the author alone being responsible for the views and opinions expressed in it. I consider it worthy of a careful perusal.—E. D. F.

less; this again accounts for the great difference of these two months in point of salubrity.

During June about five degrees less.

During July about half a degree less.

During September near two degrees higher; our most sickly month last year.

During October two and a half degrees less.

During November seven degrees less.

And during December two degrees less than the average.

With regard to the BAROMETER.—During the first six months it was unusually low, and during the last six, unusually high.

HUMIDITY.—During February and March the moisture was much over the average.

During September over the average, and during the balance of the year, the reverse, and to a very remarkable degree.

RAIN.—The *precipitation* during the entire year was more than *one inch* over the average of seventeen years. But the most remarkable circumstance was in its distribution.

During January there fell less than during seventeen years back, although the very reverse took place during February; being more than any preceding February, except that of 1842, and being near ten inches.

During August the precipitation was much under the average, being not much more than half the average.

But September was the heaviest in my record since 1834, and there resulted, what usually follows with the wettest month, viz., most sickness.

During November and December there fell little more than one-third of the usual quantity for seventeen years, and to make the record more complete, embracing the winter just past (but little out of the record), there has fallen during January and February of the present year, not more than twenty-eight per cent. of the average of seventeen years.

WINDS.—There has been a great preponderance during the year of easterly winds, as is usual during epidemic years; those from the west have been deficient; they prevail during wet years. The calms have been unusually numerous.

Now, whatever value is attached to that record, is derived from applying it to practical purposes. Its true interpretation, then, is its influence over the great industrial pursuits of life; upon the products which sustain and clothe man, and upon his sanitary condition.

Want of time will compel me to be very brief.

The heavy rains of September, about the period of the gathering of our great staple, cotton, materially impaired its productiveness; this was in a great measure compensated by the fine dry picking season of the balance of the year, frosty weather having been retarded until after the first week in November.

The cane requires for its growth and maturation much moisture in June and July; these are usually our most rainy months. Last year these months were defective in precipitation, the cane suffered accordingly. When, on the contrary, the cane is ripening, too much rain injures its saccharine qualities; the heavy rains of September, which are so different from what is customary here, tended materially to shorten the crop of the year, which otherwise would have been very great.

The remarkable drought which has now continued in such an unprecedented degree since October, it is said, has injured the cane in the ground, subjecting it to the dry-rot. This is hardly credible. In the low alluvial grounds of the Mississippi, the water is not permanently far from the surface, and at no period has this varied, from experiments made by myself, over eight or ten inches, during the entire year. This we know depends upon the surface water (from rains), and not upon the more or less height of the river. These experiments have been made in my garden, upon land that has been artificially elevated, as most of the city is; the water in my well, dug and prepared for the purpose, varied from twenty-one or twenty-two inches from the surface to thirty-one or thirty-two.

Planters and farmers are proverbially hard to please in relation to the weather; it is rarely exactly right for them long, being too wet or too dry, too hot or too cold, or the spells continuing too long. Now it is possible that the cane out of the ground, in matelat (as it is called), may be somewhat injured by too much desiccation, but when properly put up and covered, I suspect the extent of it has been much exaggerated. Time alone will show.

But, in another point of view, all of us have sustained great injury. The wheels of commerce have been almost arrested, because the products of the husbandman cannot be brought to market, to supply the wants of the community. Commerce, the lifeblood of society, which is the great agent performing for States what the heart does in the circulation of the blood to the body, is stagnant; because the windows of Heaven have been so long closed, and sufficient rains have not fallen to raise the streams which tend directly

and indirectly to produce and increase prosperity, exchanging the products of industry and supplying the vast and multiplied wants of the community.

For the first there is scarce any remedy, except in the industry and enterprise of society in providing other means of communication with the great productive basins North and West, and if we call *it* "king," it exhibits its predominant influence on our comforts and on our wants.

But there are other circumstances in relation to the climatic influence, which it is not proper entirely to overlook in this connection; these relate to its bearing on our sanitary condition. Upon this subject I am compelled to be very brief, against my inclinations; for, as astonishing and incredible as it may appear to many people abroad, this city has no Board of Health or record through which to obtain the necessary facts to show the full influence of these unusual conditions on health, and what facts I have been able to procure have been at great expense of labor and time.

This year has furnished a running commentary and strong corroboratory testimony of all the experience I have so often given in relation to the influence of humidity, and its reverse, on health in this climate. The moist months have been the sickly months, and the dry months have been the healthy months (in general), and I am sure, with the exception of cholera, which is usually produced when there is a great variation in the drying power, no winter in Louisiana has been more healthy and delightful than that which has just passed.

The reader will probably be surprised to learn that the mortality in this city last year was 11,347; that of this there died of yellow fever 2,316; and by cholera, during the last seven months of it, near 880. The largest mortality by yellow fever occurred last year, in September, according to a general fact, that it usually takes place during that month in which there is the largest precipitation and highest solar radiation (as see chart), and particularly the latter.

The conditions productive of cholera are different from those giving rise to yellow fever. Neither the temperature, moisture, or radiation required to produce the latter, is required for that. It is rather a great variation of these three elements within certain ranges, but more especially variations of the drying power. This is made very conspicuous by reducing the mortality in the form of a chart, from the ascent of the line indicating it; the larger part

occurring during the remarkably dry month of December. Precisely the same occurred all along the northern boundaries of the United States last summer, during their unprecedented drought, in exact accordance with these views, as shown to me by my very intelligent correspondent, Prof. Hunt, of the University of Buffalo, N. Y.

Upon other occasions I have endeavored to show the effect of humidity on health, and to show how dangerous the combination is with filth and heat. The present year furnishes me ample means of corroborating and illustrating my positions.

It has been said before, that the summer was unusually hot, reaching extremes of temperature we have rarely had to endure here. This was marked by the effects, in concurrence with a nearly saturated atmosphere, of the occurrence of more cases of *coup de soleil*, as it is miscalled, than has ever taken place in this country within my knowledge. I have taken detailed notice of this in another place,[1] and therefore shall only simply allude to it here. It is not then *sunstroke*, for the temperature in the direct rays of the sun is often from 10° to 20° or even 40° higher without producing this effect. It arises, according to the record I have shown, during the highest temperature in the shade, and a nearly saturated atmosphere, on individuals who have made themselves susceptible through intemperance. About two weeks after the delivery of that address I received from Prof. Charles A. Lee, of New York, a letter from which, with the permission of the Academy, I will read an extract: "You recollect that a year ago last August, there were more than 100 deaths in one day in New York by what was erroneously called 'sunstroke;' the dew-point nearly corresponded with the temperature." Other parts of that remarkable letter will show that I have had the very distinguished honor of anticipating that eminent man on other parts of this subject, or rather of putting his preconceived theoretical views into practical application.

Here then, are three of the most fatal maladies to which our race is subject, whose etiology is already traced to specific climatic conditions. But, as these considerations absolutely, and most fortunately for us, require for the production of their lethiferous influence the concurrence of an *adjunct*, it is nearly always in our power, by *preventing this union*, to control the result! For the development of the first two (yellow fever and cholera), filth or

[1] Address before the State Medical Society.

malaria is indispensable—no concentration of heat and humidity combined will produce yellow fever—no variation of these with the drying power will produce cholera; and I am almost equally sure that heat and humidity alone, without the strong predisponent mentioned, will never result in the third fatal malady. Hence then the highly gratifying conviction that man has control over all!

But the exposition of these climatic developments does not stop here. Humidity in conjunction with heat is essential to the evolvement of all the higher grades of fever, and when filth or malaria is present, fever will *certainly* break out. We can now understand, in the language of my distinguished correspondent just quoted,[1] why it was that Capt. Cook preserved the health of his entire crew during his long voyage around the world without losing a man; it was by dry rubbing the decks and the use of the holy-stone (as it is called at sea), and keeping the ship clean, and not by constantly washing the decks, not only those above where they can soon be dried by sun and wind, but below, where the ventilation and drying power is very limited. Such is a constant effect of this mode of cleanliness as expressed to me by some of the first officers of our navy.

It is a custom, and a highly beneficial one too, in some of the sickliest parts of many southern countries, to kindle fires night and morning in private dwellings during the sickly season, and I know from much experience, that it is highly conservative of health, and many a time have I ordered them to be made in the sick room. It was an empirical process which was known to do good without our understanding the rationale—or the principle on which it was based, to explain its beneficial effects. "The discovery of a principle," it is truly said, "is the discovery of a truth;"[1] and its benefit is only limited by the extent to which it is applicable.

During the late epidemic yellow fever, business took me up the coast; on returning I had to take a St. Louis steamboat, loaded with stock, and so offensive as to be almost beyond endurance. I remarked to my companion (a professional gentleman), that there would probably ensue a large mortality from on board the boat when she reached the city. In a few hours all this humid effluvia subsided—walk to any part of the boat, it could no longer be perceived; a great change in the weather had occurred. I sought a thermometer to take the dew-point, but there was none on board;

[1] Prof. Lee, in a letter to the author.

in a couple of hours we reached the city, and I immediately took the dew point, and found it at the degree where I had before announced,[1] that it was incompatible with the continued existence of the epidemic yellow fever—that is about 60°; accordingly, from that time the fever abated.

So, humidity is essential to the existence of *all odors*—whether the fragrance of the rose or the stinks of sewers, and the morning breeze is either replenished and enriched with the odors of flowers, the bounteous gifts of nature, or is poisoned with the offals of man's filthiness and negligence, as the moisture or dryness predominates.

From the interpretation resulting from the establishment of this principle, we shall no longer be at a loss to account for the occurrence of the fevers incident not only to ships, but jails, penitentiaries, hospitals, and all filthy crowded places; and can we not be enabled to thus account for the general exemption of jails and the upper stories of houses when the inmates are isolated there, in this and other countries (where it is usual to lock one's self up from the plague), during the prevalence of malignant fevers, as occurred here in 1853, when the health of the jails was affected for the first time?

The character of the fever will, in a great measure, depend upon the degree of temperature and humidity, the amount of filth, and the susceptibility of those exposed; from the Egyptian plague and yellow fever to typhus gravior and mitior and bilious fever.

Indeed there is too much reason to believe that all classes of fevers depend upon the varying amount of humidity and temperature, as essential requirements, and if we look at the characteristic condition of opposite seasons in different climates and their effect on salubrity, we shall find this view of it strongly sustained, and they are only varied by physiological peculiarities and individual liabilities.

Can we say where this important principle is limited in interpretation? or to what it does not furnish a key? Is it saying too much, then, that that little instrument (the hygrometer) will be as sure an index of safety and salubrity, in the causes productive of malarious fevers, as Sir Humphrey Davy's safety lamp is to the miner buried in the bowels of the earth?

[1] See the Sanitary Report.

PART II.—1855.

UNUSUAL elemental disturbances have marked the year, and their natural consequences have been felt throughout the whole range of organized life. Agriculture, the master employment of man, has felt it, and commerce, which is but its handmaid, has been alternately paralyzed and prospered by their excess or deficiency; it is but natural then to suppose that health, which so much depends upon them, has been materially influenced by their aberrations.

After a winter of unprecedented aridity (1854–5), about one-fifth of the precipitation of preceding years having taken place, which was followed by a spring of scarcely more than a third of the usual amount, except during its last month, which exceeded any year for ten years; it was followed by a summer in which it was very large, and exceeded the average of the same period. The autumn was also accompanied with a more than usual precipitation. Still the average annual amount was not yet reached by about ten inches, entirely owing to the great deficit in the early periods of the year. This may be considered (as will be explained presently) a fair exponent of the precipitation in the whole State. Now although this does not very materially alter the navigable condition of the Mississippi River, yet it does our own streams, and their navigation during the winter and spring was very materially obstructed by this deficiency. The river Mississippi receives its supplies from sources vastly beyond the limits of this State; but such has been their deficiency during the same period, that we have actually had a lower river during the whole year, with the exception of a week or ten days in April, than has been paralleled for a period of thirty years.[1] This condition has seriously told upon the great interests of navigation and commerce, and all those thousands of wants, comforts, and necessities which derive their gratification from them.

When more attention is paid to meteorology and its regular records, the condition of the river and all its multiplied and varied interests, can be regularly foretold here at an early period—sufficiently in advance to forestall speculations in the produce market,

[1] As per exhibit attached to the chart.

and thus prevent ruinous elevations and depressions of prices. Even at present, much of this can be ascertained in advance. Thus, severe weather continued for a certain length of time, locks up the Ohio and other streams in its icy embrace; the exact temperature and duration are to be ascertained by a comparison of registers. Ours, of course, being recorded here, and as our cold proceeds on the wings of the north wind,[1] which is the most rapid wind that reaches us from any quarter, less than a day is usually sufficient to convey to us here the temperature of a large portion of the valley of the Ohio. Again; that region receives its supplies of rain from the Gulf of Mexico, or, at all events, from points S. W. and S. of us; hence by noting the directions of the cumulus or rain-bearing clouds, together with their elevation and velocity as passing over us—which every meteorologist should do several times a day, in his daily record;—it is not difficult to tell when rains may be expected to be deposited in the valley of that stream so important to us; hence, also, the breaking up of the ice-bound river, and the swelling of the almost exhausted current, may be predicted even now with a considerable approach to certainty; and it accordingly has been done repeatedly.

The season just passed (winter), although not all of it directly within the scope of this report, yet has been so remarkable, and, in the opinion of many, has had such an important bearing upon our sanitary relations for the summer, that it would not be proper entirely to overlook it. These will be adverted to presently. Two circumstances have remarkably characterized it; its great precipitation and its long continued depressed temperature. In relation to the first, more rain has fallen than during any winter since 1842; about which period our climate was characterized with immense precipitations, embracing the years 1838–9–40 and 1841. And in relation to the latter (or its temperature), no winter for more than thirty years approaches it nearer than a fraction less than two degrees, and that was the winter of 1837. It has been the coldest by near seven degrees, than the average of 33 winters, and it has had the coldest January of any that has occurred since 1826, when it was only ½ a degree colder. The thermometer, however, has on several occasions descended lower than it has during the last winter; but I know of no record where it has kept so continuously low so long. The severe spell commenced on Christmas day, when the mercury

[1] If our low temperature does come from the north!

descended below the freezing point; again it rose as high as 65 degrees on the 29th, descended the next day, and with the exception of two days, was below or in the neighborhood of 40 degrees, or even below the freezing point, at least on twelve days, at sunrise, the whole of the month of January, but once getting above 60 degrees, and that on the 26th. The average for the whole month was 41°.38; or below the ordinary temperature above ground, when frost is found at the surface. When it is recollected that this temperature existed in the city, it must be supposed that that in the country was much lower in open fields far removed from the protective influence of forest growth and freely exposed to radiation.

The average temperature of *February* was about ten degrees warmer, or 51°.15, and its average has only been exceeded in rigor, by the Februaries of 1855, '38, '34, and 1831. Throughout the United States it has been a winter of almost unprecedented severity, and probably as much snow has fallen as has ever been recorded; so much so as in many instances to put an entire obstruction to travel by railroads and other modes of intercourse. This produces a fine effect on countries where the cereal crops are the main staple, as the ground is thus protected against the extreme severity of the winter's cold, undergoing a temperature of but 32, while above the snow, it is, in some parts, near 100 degrees lower! Under these circumstances the gradual return of a spring temperature prevents the fruit from advancing too rapidly, to be cut off by an occasional frost; a certain series of means of temperature being required for the flowering of each. The advantage thus gained by the protecting mantle of snow, has not been extended to the sugar region; hence the cane in stubble as well as that in matelat has suffered much from the severity of the winter's rigor. Cattle have also perished from the extreme and prolonged severity of this remarkable season.

To answer a very general inquiry in relation to its influence on the summer's salubrity, I reply, that from an examination of all the records made here, no condition of the winter expressed, either in temperature or precipitation, will enable one to predict, with any certainty, what will be the salubrity of the summer and fall following. It has been one of the healthiest winters known in our records, as well as the coldest, and although the precipitation has been so large, yet it has not been a *moist* winter, technically speaking.

The influence of the meteorological conditions on the southern crops for the last year have been highly favorable, but the rise of the rivers at an early period did not favor their conveyance to market. Table A furnishes a complete and very detailed exposition of the climatic peculiarities of every month in the year.

Before applying these climatic conditions to show their influence on the sanitary relations of the year, it will be proper to exhibit other circumstances which have been connected with them, having an equally strong bearing, to show the result of the combination, which has so often proved disastrous to the health of this community.

1st. Gormley's basin—which has heretofore been the seething receptacle of the filth of a large portion of the city, having an area embracing upwards of 100,000 square feet, has been in the process of being filled up *during the whole summer, and mainly from the filth and garbage of the streets!*

2d. A large bone-black establishment, located on the western margin of the 4th district, has *received* and *used up* near 1000 head of dead animals during the year, and has raised, fattened, and *sold at the different markets of the city, more than* 300 *head of hogs, and from* 150 *to* 200 *dozen of fowls, besides innumerable eggs!* and they have been wilfully imposed upon our citizens as good food, who were ignorant of their qualities; and large quantities of pork and fowls have been, I am informed, supplied to the markets from most of the slaughter-houses, where they were fattened on offals.

3d. The river bank, with an unusual stage of low water throughout the year, has furnished an immense space for the reception of filth and the disengagement of noxious effluvia.

4th. Our backyards, water-closets, and streets, with the numerous pest houses and crowded dwellings in our midst, have all aided to enlarge the bills of mortality; producing conditions resulting in the development of cholera in the spring and yellow fever in the summer and fall; the first numbering 885 victims, and the second 2615.

The liability of most of these as the efficient agents to produce disease has not been overlooked in the previous investigations of this subject. A repetition, like the endless drop of water on the solid rock, may ultimately have its effect, and if one is made a martyr by it, thousands may at last be saved. The complaint here is, not that the injury sustained does not arise from the sin of omitting to do what the experience of the world deems necessary to be done in

order to avoid these perennial sacrifices; but in doing what our own constant experience of half a century or more has invariably warned us has been, and must be the influence on the public health, as that of the disturbing and filling up a vast area during the summer season, with the filth and garbage of the streets, and mixing with the long concentrated immundicity of former drainages, besides the other sources of insalubrity.

But it does seem that what we *breathe* is not deemed sufficient to aid us off in our short career, but a helping hand must be given by what is to be furnished us as nutriment. By our second category, it will be seen that a laboratory of poison has been prepared for our stomachs, by the open sale at our markets, of swine and fowls, feasted and fattened on the flesh of animals dying of disease! It is hardly to be credited that any community, having the least regard to the health of its members, would be so reckless as to permit meat thus prepared, in a mode so unnatural, to be sold in the public markets!

Hog meat under any circumstances, unless properly prepared and seasoned, forms a very doubtful part of the regimen of dwellers in a hot climate, but raised and fattened on unnatural food, and that food from animals *dying of disease*, becomes little less than poisonous. The ancient Jewish lawgivers, among their wise health ordinances, forbid the use of this food altogether, even when raised upon proper materials (of a vegetable nature), and this has been followed by their descendants, to their incalculable benefit. The liability of its use to produce diseases of the skin, and particularly derangements of the intestinal canal, resulting in worms, and especially that worst form, the tapeworm, from which the Hebrews are exempt, and to which the pork butchers are particularly liable, and also dogs when fed upon it, are sufficient grounds for its total prohibition, in hot climates at least, where the digestive organs have not the strength they possess in climates invigorated by a lower temperature. But when to this is added the unnatural way by which they are prepared for market, such food is only to be looked upon as *positively poisonous*.[1] It is thus we may in a great

[1] By the above remarks it is not intended to express a doubt that the stomach of the animal has vast digestive capacities, and can appropriate to its own nature food of a very offensive quality; for it is known that some poisons that even kill the animal using it (as the moarara), do not injure those partaking of its flesh; but that others which are not digested, as strychnine, enter the circulation, and are fatal to those who use the flesh as food. Nevertheless, it is still contended in the

measure, joined with other circumstances, as bad water, &c., account for the epidemic cholera of last spring, and the aggravation of the whole class of zymotic disease, to which the poor of the two upper districts have been particularly subjected for several years; what is certain, is that it has greatly aided in producing those disastrous influences under which they have suffered. This abominable imposition on the credulity of our population, was tried for some years in the lower districts of the city; it was, however, early found out by that portion; so much more careful of their injesta than their neighbors above, and the market soon became lost to them, and was removed about five years since to a portion of the city more gullible and less nice, and hence one prolific cause of the increased mortality in the upper districts over the lower, during the whole of this period. It is a shameful nuisance, disgraceful to the city, and should be at once abated, with or without a Board of Health to point it out. In many communities there would be a still shorter cut. This and many other nuisances and festering sores would, long since, have been exposed to public animadversion, had the recommendation of the late sanitary commission been carried out, and a special *sanitary survey* of the whole city made, as it should have been. But the expense of a few dollars was objected to, and an expenditure of hundreds of thousands, to say nothing of an immense sacrifice of life, has been the result.

During the whole of last year the river continued unusually low, as seen by the diagram attached to the lower part of the chart. The value of high water in covering the great and extended ulcer spot of the wide and exposed banks, festering with causes of disease, is clearly apparent when I state that we have never had an epidemic of yellow fever in this city in which this extensive surface was not thus exposed. This is one of the causes which influence the minds of many to believe in the foreign importation of

text, that pork is a very gross and unhealthy food in a hot climate under the *best circumstances;* but that when *unnaturally fed*, and particularly on *diseased meat*, it is still further injurious, and nearly approximates the carrion crow, which no one can eat. Indeed, we have abundant analogies in direct support of this view of the subject, with only one of which I shall content myself. Hogs fed on certain fish on . . . . . Lake in this State, became so poisonous as to sicken all those who partook of their flesh.

Animals prepared in this way have their flesh very firm, and the fat is so remarkably white and solid as to be sought after, and finds a ready market, although no grain is fed to them. The supervisors, however, are very careful, I am informed, not to use it as food themselves!

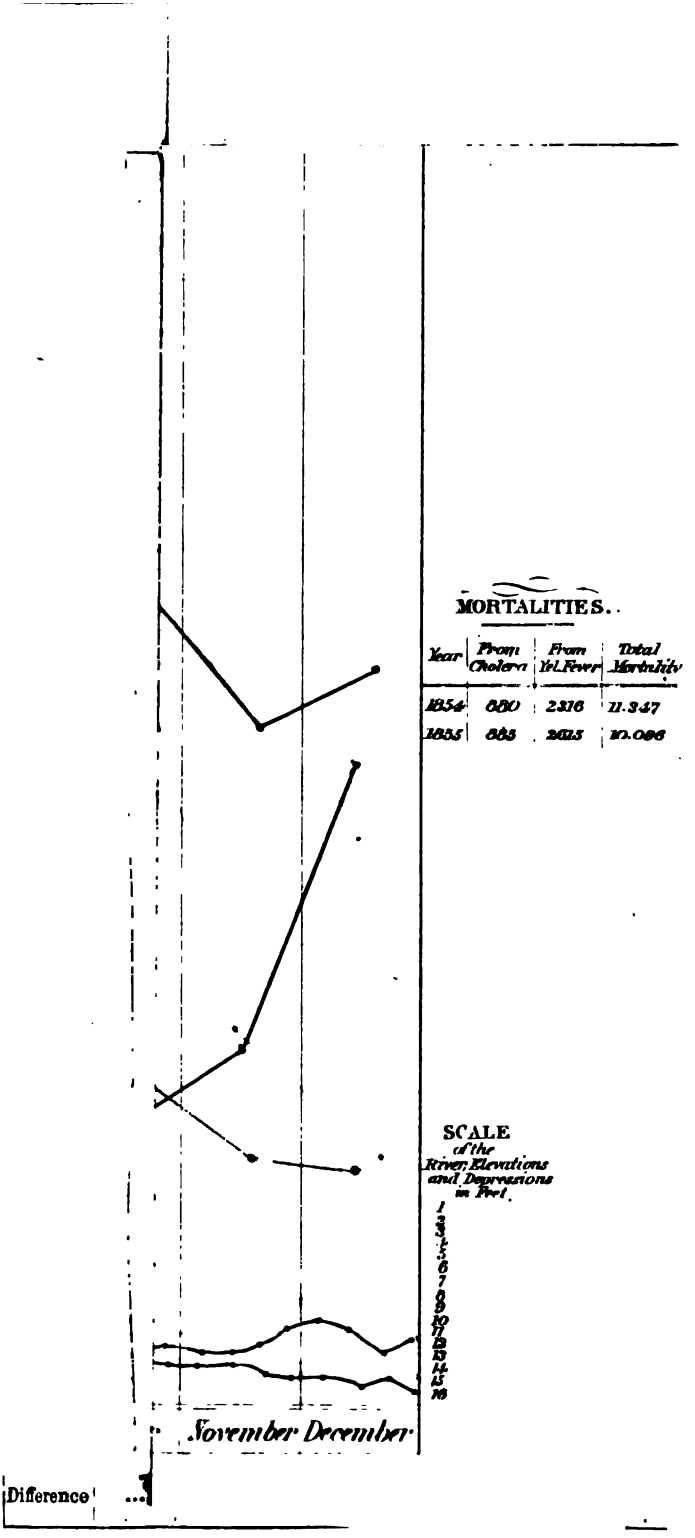
the disease; the shipping is all here, and a large portion of the unacclimated population; and here is one of the largest sources of filth connected with the city, and what is worse, it is *entirely neglected.* There is some show of attention to the streets, they are before the eyes of every one, and particularly about the marts of business; but these are comparatively trifling in comparison with our backyards, river banks, and miserably crowded hovels for that portion of our population from which is drawn the wealth of communities—the laboring class—improvident, and too ignorant or unable to use the requisite means to take care of their own healths, and which thus devolves upon a humane public. Now in relation to all these, last year nothing was done; the "poison," if you will, was manufactured and (to use the strong expression of Simon), "the test and touchstone," the meteorological ingredients, were present to perfect the combination, and the disease has been developed.

I present you a chart representing as much of these as can be put upon such a sheet. It embraces the mortuary and meteorological conditions of the last two years. I put both on the same sheet for the sake of comparison, and with the table accompanying this report, you will be enabled to understand fully their relations to each other. Let us make a few comparisons—while you are examining the chart.

The total mortality for 1854 was	11,347
" " 1855 "	10,096
The yellow fever mortality for 1854 was	2,316
" " " 1855 "	2,615
The cholera mortality for 1854 was	880
" " 1855 "	885

It is usual for the height of the yellow fever to occur in months of greatest humidity and precipitation, and if there is any exception to it, it occurs in the month immediately preceding, *but never in the succeeding month;* accordingly, that rule is verified here, as seen in the chart and explained more fully in the tables. The river in both was at its lowest stage. The most of the cholera in 1854 occurred in December; it was then comparatively dry, and river low, while in 1855 it occurred in May and June during precisely the same relative conditions.

In relation to table C, which illustrates the meteorological conditions during cholera, it is proper to state, for its proper appreciation, that every month in the year has its peculiarity in relation


MORTALITIES..
Year | From Cholera | From Yel. Fever | Total Mortality
1854 | 600 | 2316 | 11.347
1855 | 883 | 2615 | 10.096
SCALE
of the
River Elevations
and Depressions
in Feet.
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
November December
Difference

.ty in relation

to moisture; that is, there is a normal quantity due to each month, different from every other, principally resulting from differences of temperature, and therefore we cannot properly compare one month with another of the same year directly, but with its corresponding month in other years. Accordingly, in this table, I have compared the average amounts of moisture accruing during the reign of epidemic cholera and corresponding months of other years, when it did not prevail; we thus arrive at the fact of its variance from the normal amount due that month. With this explanation, by referring to the table, it will be observed that the drying power is greater, and the humidity and number of grains of moisture in the air *less during cholera*, than during similar months in other years. It is now more than seven years that I have called the attention of the profession to this fact. One of the most conspicuous is the variation in the drying power producing an erethism upon the surface, which is transferred by direct sympathy to the mucous membrane of the intestinal canal. It is precisely this condition, which, acting on the mucous membrane of the lungs, produces influenza, the uniform precursor of cholera, and that, at these times, there is a prevalence of those dry fogs noticed by Baron Humboldt as occurring in South America. Such, I believe, is precisely the weather which propagated the cholera on the northern frontiers of the United States last year.

C.—*Table exhibiting the difference in Hygrometric Conditions during the months of existence of Epidemic Cholera in New Orleans, and the average of corresponding months, of other years, when it did not exist.*

DURING THE MONTHS OF THE EXISTENCE OF EPIDEMIC CHOLERA.							CORRESPONDING MONTHS OF OTHER YEARS WHEN NO CHOLERA EXISTED.			
Year.	Month.	Cholera mortality.	Total monthly mortality.	Drying power.	Humidity.	No. grains of moisture in a cubic foot.	Corresponding months in other years.	Drying power.	Humidity.	No. grains of moisture in a cubic foot.
1849	Jan.	628	1062	6.89	.802	4.872	Januaries of 1850, '51, '53, '54	5.59	.838	4.710
1849	March	813	1392	9.97	.748	6.223	Marches	6.90	.810	6.004
1849	April	405	974	6.84	.774	5.996	Aprils	6.34	.815	6.821
1853	Dec.	332	844	6.02	.823	4.007	Decembers	5.53	.847	4.778
1854	Dec.	322	887	8.69	.710	3.517				
1855	May	402	583	10.12	.744	7.656	Mays	6.10	.844	7.824
1855	June	436	1122	8.13	.774	8.289	Junes	5.56	.847	9.229
Averages	...	...	...	8.09	.767	5.794	...	6.00	.833	6.561
Difference	...	...	...	2.09	.066	0.767	...	...	...	...

Such, then, are the *facts:* but it may be proper to say that no one kind of weather always produces cholera. I am sensible that statements are against my table in places where the disease has prevailed, and that elevation, and consequently, more or less aridity, seems averse to its propagation, and that its greater prevalence seemed due to superabundant moisture, if, in other respects, they were similar. This, however, is not decisive, and it will not be until proper experiments are made and repeated at these several localities at the time of their occurrence, and thus compared with others made at corresponding months in other years when the disease was not prevailing with the same exactitude as has been done here. At all events, the facts themselves are always valuable, and may aid in evolving the etiology of this mysterious disease hereafter.

Meteorological conditions, that is, heat, moisture, and solar radiation, mainly produce, nay constitute those great differences in which one climate varies from another, and, of course, are the principal agents in producing not only the varieties of vegetable and animal life, but the different diseases which afflict the different races of men. A curious, but most striking proof of this habituation is shown in the fact I have ascertained as closely as the records I could obtain would furnish me, viz: in an average healthy climate the annual mean of the thermometer and hygrometer is nearest reached in those months which are generally the healthiest, on an average of years. This is so near in the many cities to which I have applied it, as probably to constitute the law on the subject. Applied here, where my facts are most abundant, the proof is direct and unequivocal. I have applied it also to many other places, and although my records have not been so minute as here, yet the rule seems to hold, or approximate with sufficient regularity to constitute a law. To make this as near exact as possible, years should be selected that are not influenced by any unusual disturbing causes amounting to epidemics.

There are two general conditions here, as well as everywhere else, in relation to the production of the great mass of zymotic diseases; the first and most important has been classed as terrene, embracing all filth in its widest acceptation, and the second is meteorological conditions. The first is, undeniably, always under the control of the civil authorities in all well constituted communities, and it is as much their duty to take care of the body politic under their control, as it is of their personal, political, or property rights; nay, it seems to me that this is the *most important*, as it is the most

valuable, and without which the others are useless. Surely it is excess of folly to say that municipal authorities have not the power, if they *understand their duties*, to have the backyards, privies, river bank, and streets kept in a cleanly manner—that they cannot abate such nuisances, and bone-black and other manufactories and slaughter-houses, and crowded, filthy, unventilated residences occupied by our poorer classes, whose labor is so essential to the public, and on whom mainly the fatality of these negligences fall. I say it is perfectly ridiculous to offer any excuse of inability, while thousands are lavished upon objects of infinitely inferior value. Here, then, it is palpable that the body politic has this part of it entirely under their own control, and that really there is no excuse for its neglect that should be listened to, or acquiesced in by an intelligent constituency. Presently, I will attempt to show what has been the approximative cost of these negligences, not in money, but in life, and what the public has suffered from making improvements in an improvident manner; that is, from not having been governed in making them by those lights which the uniform experience of mankind and the developments of science have pointed out. But, first, let us see how much control man has over the second, or meteorological conditions.

I have shown, in another place, how peculiar the climatic condition of New Orleans is. For my present purpose, it is only necessary to dwell on those of its rain and moisture, for here the great difficulty lies, not only in relation to the salubrity of the place, but to its fitness at all seasons of the year, as a mart for commerce—its influence on most articles of consumption or wear, and even for transit purposes. Now, I assume it as a vital question, only inferior to the other, *that these must be controlled.* You may build your railroads, as many as you please, you cannot succeed in making this city a great mart for commerce, or even a permanent factorage, unless you control this *undue moisture* and precipitation, and, most fortunately, there is an inseparable connection between them and health—what controls moisture for the benefit of commerce does the same for health—otherwise we should probably never have had any ordinances exclusively intended to subserve the purposes of health at all! and I repeat, this is most fortunate. None of the blessings of man are isolated—grouped together, as it were, are all the kindnesses of Providence—with the practical application of high intellectual endowments—with a full knowledge of what has influenced man's condition in the ample and brilliant pages of his

history—comes the high moral and the sanitary advances. Such has been the condition of man, in ages past; such is the condition of man now. Where health is not enjoyed there is recklessness of life and low morals, and money is sought for present gratification or accumulated for enjoyment elsewhere, and intellectual culture is rather subsidiary to it.

For permanent advancement, then—for the attainment of the lofty end—the object of all civilization and all refinement, a stable and of course a healthy population is indispensable. It is shown above, how this object can be accomplished in relation to the first means; the details I have no room for, now; they have been given in all needful minuteness in the Report made by the late sanitary commission to the city councils; nor has a word been said impairing the nature, or detracting from the correctness of that report anywhere; it has been received as authority throughout our country. In relation to the second or climatic influences, some additional details corroborative of the views therein expressed, will, I am sure, not be unacceptable. They will go to show you that *man has influence in even materially modifying the climate in which he lives.*

It became necessary for me—in explaining a portion of that report before this body, last year, in relation to rainy seasons, and the amount of precipitation during particular years—to show their bearing on the health of the community, and for other purposes, to ascertain what was the probable amount of precipitation in New Orleans in 1825 and up to and including 1829. I could not then ascertain that any record had been kept of it at all at that time, and it was necessary for me to find out from my own records, what relation the precipitation in New Orleans bore to those in other portions of the State; to see if there was not some permanent relation between them; for this purpose, it was necessary to procure all the records of rain which I could, by any means, get access to in the State. This was finally accomplished by procuring those of Plaquemine, below us, to Donaldsonville, Baton Rouge, St. Francisville, Natchez, Rapids, &c.; even Monroe on the Washita, in the northwestern part of the State, embracing a pretty fair representation of the different sections of the State. The whole were then tabulated in a series to correspond. This trouble I took from believing that the great Delta and contiguous regions, were influenced by similar causes in this respect, and that their rains proceeded from the same regions, and, borne by the same winds, had intimate connection, and the result showed that I was right. Three import-

nt deductions flowed from this investigation: 1, that a rainy season r year, in one portion of the delta, was almost uniformly accom-anied by a similar condition in another; 2, that a rainy season nd a sickly season were usually concomitant, or that the one result-d from the other; and 3, the special object of my repeating these emarks now, viz: that about one-fifth less rain was usually preci-itated on New Orleans than on any part of the State! This very remarkable and very unexpected result is a fact pregnant with the most important consequences to this city, as I will now proceed to show.[1]

The early precipitation, either here or at any other portion of the State, is not with certainty known anterior to my own records made upwards of thirty years ago. This is to be deeply lamented, because it would show us the influence of clearing the country and draining it upon its salubrity. But, certainly, there is no reason why we should lose any more valuable time in commencing the data for these important facts. Now, there is no reason known to me why the location of New Orleans, *in its natural state*, should prevent its receiving as large a precipitation, certainly as Monroe, on the Washita, at the extreme northwest of the State, if not of Plaquemine, below us. In relation to its former condition, some forty or fifty years back, we have, unfortunately, I repeat, no records; we must then fall back upon the probabilities, and these are just as plain and palpable as in the case I have referred to above. It is clear and probable enough, then, that this location did receive as much rain as any other part of the State in former years, and that the difference, as found now, must arise from two circumstances altering that condition; the one is from the extensive clearing and draining in the neighborhood, and the other from the constant combustion and drying power incident to a large city. Let us illustrate these by what is known of their effects elsewhere.

It is to be deeply regretted that in our own country the use of

[1] Long after that paper had been read to the Academy, Mr. D. Blair, the present superintendent of the water-works of this city, and an old resident, assured me that he kept an account of the precipitation at the period referred to, and the conclusion I have come to was entirely borne out by his recollections of his own record (which has been since lost); indeed, his mind was particularly impressed in relation to his own, and this is the reason why his memory of an occurrence so distant, is so exact, viz: the small amounts at the dates anterior to 1829 being, one year, but 27 inches (I have never made one less than 39), and that of 1829 reaching the enormous and *unprecedented* amount, in any journal entitled to credibility, to 92 inches!

the rain-gauge, in parallel instances and cases, has not been rec
at periods sufficiently remote to enable us to draw such infere
as are applicable to the case under consideration, in a suffic
definite manner.

The cities of Havana and Vera Cruz, however, furnish str
illustrations to show the effect of removing the forest grow
their immediate neighborhood in diminishing the quantity of
cipitation from one-third to nearly one-half in the course of
than half a century. The American people have been startl
late years, by having their sympathies awakened in behalf of
starving inhabitants of the Cape de Verd Islands; the cause
been most demonstrably traced to the destruction of the fo
growth, rendering the islands too dry to cultivate vineyards
almost anything else successfully; the climate has been consta
shown to grow less and less humid; the streams to diminish; t
fountains to dry up, and consequent sterility to take the place
that verdure which gave its name to these once fine and beauti
islands.

The instances of extensive tracts of country having their com
rative fertility impaired by this species of denudation, wantonl
depredating upon the magnificent drapery with which nature ha
clothed our earth, has long been furnished in the old world as w
as in this, and even many parts of our own country; and nothing
strikes the American traveller when he visits the homes of his an
cestors in the old countries, more than the nakedness of the country
and even its hills up to the mountain tops. Palestine in the older
times was a land of rivulets, and fountains gushing from every hill
and was then distinguished from Egypt which was "watered by
the foot." And the ancient fertility of the promised land which
supported the dense population mentioned in sacred writ, has, with
the removal of its forest growth, dried up its gushing fountains
and it seems, long since, to be laboring under the curse of God.

The present city of Mexico, although built on the ashes and site
of the renowned Tenochtitlan of a couple of centuries or so ago, is
now near a mile from the margin of that beautiful lake, within
which it was then but one of the islands. And the lakes and
streams in that magnificent country have been dried up, and sterility
and barrenness, and sometimes famine, have overspread regions,
not only here but in the West India Islands, once the most fertile
in the world; but, wherever the foot of the Spanish Attila has been
placed—for he cuts down and never plants—he ruthlessly robs the

earth without compensation, as well as its inhabitants, and barrenness is the predominant trait; nay, his own country shows the propensity of his race rather to destroy than to foster, and the interior of Spain, although having seas on its eastern and western boundaries, is one of the most denuded and driest countries in Europe; and this people, to whom, in the providence of God, it was given to possess the fairest and most fertile regions of the earth, have, by their recklessness and improvidence, proved rather a curse than a blessing.

The impoverishing nature of this criminal carelessness in relation to the forest growth, besides its requirement for fuel, has long since compelled the governments of Europe to pass ordinances strictly limiting the alarming process, and induced them to enforce on the inhabitants to plant where they cut down. Indeed, it is said that there is now scarcely a tree in England which has not been planted by the hand of man. Our own beloved country, young as she is, has already suffered from this improvidence in removing the covering and protective influence of trees, and the hand of the husbandman has in vain been applied to the arid soil in some portions of it to extract from it that nourishment intended under wise culture for the sustenance of man, although it has heretofore been as conspicuous for its rains as its high temperature, two circumstances which have rendered it, and particularly the southern portions of it, the most remarkable region in the world for the most valuable crops. This is no modern theory; the wisdom of the ancient Greeks made tree-cutting and devastation as convertible terms; hence some of the famous fountains of antiquity now flow only in song; rivers of historical renown have shrunk to scarcely brooks, which a child may ford, and the Lernian lake is now a stagnant pool overgrown and hidden by reeds and rushes, that the traveller might pass without being aware of its existence. The famous Rubicon has dwindled to a little rivulet, so insignificant that it cannot now be certainly identified—"the pope and the antiquarians being at issue on this point."

So much, then, for the facts, now to be denied by no one versed in historical records; but as experience in our own State has not been acquired with any positive certainty, because measurements of precipitation do not extend to sufficiently remote periods, to assure us of the actual occurrence, we are still not deprived of the strongest presumptions, short of absolute certainty, arising from what has been the actual occurrence in other countries, similarly situated as

ours is, just now adverted to, and from the mode of action of the causes themselves, to make the application sufficiently definite and precise.

The mode of action—the reaching the sources of the hidden fountains of all our springs and rivers in the atmosphere, is intelligible enough. Trees act in various ways in regulating, equalizing, and distributing the supplies of rain and moisture; they first invite its deposition from the lower temperature always existing in the dense forest, in comparison with the open fields, and thus condense it; it is then retained by its foliage; the soil beneath them being softened by their roots retains more rain, and their sheltered situation prevents its being too rapidly evaporated; hence it is that forests are always moist and cool in comparison with the open country exposed to the full influence of solar radiation. It is from these well-known effects that growths of trees have been planted in hot, arid regions to produce these highly desired results.

The Island of St. Helena has been mentioned as an illustration of the influence of planting trees to invite moisture for the purposes of vegetation, and since the imprisonment of Napoleon there has made this spot famous, it has been converted by this means from an almost barren waste into a fruitful island. Baron Humboldt mentions the instance of Lake Valencia in South America, which was almost dried up from the neighboring forests being removed for the purposes of cultivation; but this being arrested from the political disturbances in the country for a number of years, the rapidity of tropical growth soon supplied their place, and was speedily followed by return of water to the lake. Instances might be multiplied, *ad infinitum*, to show the influence of clearing, draining, and replanting a country, whether the object is to subtract moisture from it or add to its amount.

There is another and more direct mode by which this moisture can be ascertained with more certainty than by the rain-gauge, and that is by the hygrometer. Unfortunately here, too, our means of information are still more deficient. In my researches into our past climatic history, I came across a meteorological journal kept by that scientific surveyor, Lafon, in 1807, 1808, and 1810. He, at that early period, endeavored to supply this great desideratum. The means he very ingeniously used cannot now serve any purpose of comparison with those of the present day, and are hence useless. But that the climate has become drier since the clearings and drainings have commenced, there can be no doubt. It is a general im-

pression among scientific men, from the probabilities derived from theory, that our dew-point, a measure of moisture here at sunrise and 9 P.M., expresses either saturation, or but 1 or 2 degrees above it; I have many times seen it, at the latter period, at from 5 to 13 degrees above these, and even during the preparation of this paper, and at the former from 5 to 8 degrees above it. At mid-day I have often recorded it at 30 and 35, and sometimes 40 degrees above saturation. These indicate a degree of desiccation very rarely observed anywhere. Doubtless this can be extended to a wider area and become a permanent state of things, by a proper extension of draining and clearing, and such a pavement as to prevent evaporation from the earth, and health and commerce will both be immeasurably benefited by it. We shall not then have to dwell in an atmosphere reeking, at times, with moisture almost to saturation—the solvent or medium of every noxious gas—nor will flour sour and dry goods spoil by a few hours' exposure in such an atmosphere.

We thus clearly see that we have it in our power, by following the successful examples I have detailed to you, to exclaim triumphantly in the eloquent language of Malte-Brun, "that vanquished nature yields its empire to man, who then creates a climate for himself."

I trust, then, it has been satisfactorily demonstrated that the two great impediments to the advancement of our neglected city can be removed by assiduity under the direction of science and skill. What other obstacles then can possibly intervene to prevent the glorious consummation so devoutly to be desired? These obstacles are of a twofold character, and, strange as it may seem, the

First is to convince the public mind that the *evil exists!* and it is most extraordinary that this should be needed now after our long and bitter experience, and the exposition of the facts so fully set forth by the late sanitary committee. The mind that is now skeptical would be incredulous were one raised from the dead, so I thus dismiss this part of my subject.

The *second* is, IMPROVIDENT LEGISLATION. Under this head, it is absolutely necessary, for the elucidation of my subject, to make some very disagreeable retrospections. I do not intend to show in it the loss in money this community has sustained from our various epidemics, for that is incalculable; but, that the increased mortality to which our city has been so often subject, has, in great part, resulted from the, no doubt, well meant, but certainly *ill-timed* and

ill-directed endeavors at public improvements, and to show the constant necessity of an advisory board or officer to consult in the projection, or the execution of all alterations of physical conditions at least during the hot season in a climate where these are so liable to influence the public salubrity.

Let us, then, *sans peur et sans reproche*, review some of the past action, whether of legislative or municipal authority, in reference to these physical alterations or improvements, which have had and an unquestionable bearing upon the health of the community. I do not pretend to doubt but that the best intentions actuated the officials at these efforts for public amelioration, and whatever blame is to be attached must be supposed to arise from the defect of proper information in the authorities in relation to the effect of these alterations on the public health. Where was the information to be obtained? Certainly only from those who have made this department of knowledge their special study; there is no evidence that these were ever consulted. But it is a matter of public record, in a series of publications, which have from time to time been put before the people here, by that philanthropic body (your medical faculty) from 1816 to the present day, constantly advising the necessary measures to be taken for the public health, and warning against others, thus showing how nobly they have performed their duty to the city. Have they ever been heeded? Has their advice ever been taken? Not at all. Entire recklessness has governed the city councils. The bitter experience of one year has had the soothing name of oblivion passed over it before its successor arrives; all information derived from the past as a guide for the future, has been utterly ignored, and not that past of other places and of other climes, but that of our own and of yesterday, as it were, in which we all were participants—nay sufferers. "Ignorance may be bliss" where a calamity is inevitable, but in a legislator whose councils are to control or influence for the future, the interests and destiny of thousands, and as this is done by the acquirement and exercise of that intelligence derived from past experience everywhere as well as here, it must be candidly acknowledged, it is nearer allied to a *curse* than a "blessing."

Let us then see what has been some of the results of ignoring the information to be derived from the records, the painful and indelible records of past experience. Now it has been a matter of authentic and uncontradicted fact that all our great epidemic calamities, without exception, have so constantly followed on the heels of our

great physical improvements, commencing with that resulting from the first exposed excavations from digging the canal Carondelet in 1796, to the present day (detailed fully in another place), that they at least should have excited attention and invited investigation, as they unquestionably would anywhere else. Has this been done? Not at all, with the exception to be mentioned presently. Calamity was sure to follow each one, and still they passed by "like the idle wind." Nay, the inhuman remark has been often made, in earlier times, that this fever was rather a blessing than a curse! Finally, an epidemic, which in its well known ravages not only sweeps to your charnal house the stranger and the emigrant who comes here to make his home, and aid you in conquering the swamp and subduing the jungle, but seizes its frightful tribute from those apparently enjoying the much vaunted immunity of nativity, and years, and colors, then the drowsy city legislators are finally aroused and appoint a board to investigate the condition not only of the late, but of all former causes of insalubrity. That commission, in due time, reports and points them out in great detail, and requests that a sanitary survey be immediately made of the entire city, and that steps be taken to remedy the condition. And what is done? Nothing—literally nothing! Directly in contravention of the advice and warning given, work is continued on the basin in the rear, the most filthy canals are cleansed out and the offals exposed to a summer's sun, and with the other causes enumerated in the report, as influential, another epidemic takes off near 2400 more victims from your lessened population. Now it is thought *something* will be done surely. But to the astonishment of nearly every well-wisher to the city, but the deluded, both at home and abroad, the determination is now come to to take the shorter cut and adopt the desperate course of denying the truth of more than fifty years' experience altogether, and attribute all our ills to a foreign source, not only against every theory of probability, but even where the common "law of error" does not exist! rather than have the manliness to acknowledge ignorance and set about correcting it, at even so late a period. And as if to make this experiment more conclusive (on one side or the other), the city was left in its normal condition, the *experimentum crucis* of mixing up nearly all the concentrated filth of the city in one great witch's cauldron, at Gormley's basin, and other conditions, mentioned in a preceding page, was fully tried, and the result, true to its antecedents, has as invariably followed; the besom of pestilence has again swept over our devoted

city, carrying with it 2615 victims by yellow fever. But the remedy, the prevention to all this mass of ills, what becomes of that? Unskilful teachers with an obstinacy worthy of a better cause, determined not to acknowledge the fraternity of any pestilence, have induced legislative authority to establish a Quarantine as a placebo for every ill! Its boasted virtues had no effect; the fever broke out, almost simultaneously, in different and distant sections of the city, and it was fondly hoped that at least one benefit would follow this additional but melancholy page of historical fact, and that the lesson so recently furnished at such a great sacrifice of life, and 100,000 dollars of expense, upon an impoverished people and crippled commerce, in spite of the vaunting of the neophyte in the past, would result in the public mind being now content with the conviction of its inefficiency without further experiments. But not so; political partisans are to be rewarded, more follies are to be perpetrated, and the patience and long suffering of this people are to undergo another year's trial.

It is never to be forgotten, that city life is artificial life; hence more and different causes of disease exist than in the surrounding rural districts; this discrepancy is often as high as 40 per cent; and that no city can grow in population from its own natural increase. These must be sought out to be ascertained, for it is perfectly evident that when the causes of disease are unknown, neither science nor skill can do anything to improve the health of a community. Municipal legislation then must be adapted to this altered and peculiar condition. It would seem that common sense, as well as science, dictate that we should understand our condition, and the circumstances which influence it, before applying means for the removal of obstacles that almost every one acknowledges to exist. Instead of the alleged "boundless salubrity," epidemic after epidemic almost decimates our population, while in former periods an epidemic at varying intervals of years visited us; of late years two have annually cursed your apathy and indifference, while it seems the sanitary survey so often urged upon the councils, is feared will expose some frightful and dreaded mystery, some incurable evil that will not bear the light, or some exposure which must be shunned or kept from the people. Now, no excuse of expense is for one moment admissible, when it has been shown that neither a proper health department nor sanitary survey will cost one-third the amount expended on this quarantine in a single year, without an iota of benefit whatever!

If the cleansing of the Melpomene Canal, in January, is to be considered a proof that the voice of experience is at last listened to; it is certainly not a further corroboration of it, that the filthy materials found at its bottom were to be distributed on the streets, and used to fill up low places on our public squares, and although the mortality has not been increased by it, intermittent fever, a rarely fatal disease with an acclimated population, has very extensively afflicted our citizens, in a season unparalleled for its sanitary tendencies.

Again; the clearing and draining the swamp from the rear of the city to the Metairie, commenced more than ten years since, was in the abstract a wise and salutary measure; but the *time* and *mode* of its accomplishment—in the sudden exposure of such an immense surface to a broiling sun, unprepared and unprotected—have unquestionably, in conjunction with the other causes already pointed out, been the efficient agents in the evolvement of that increased mortality which ever since the year 1845, the period of its commencement, has so greatly afflicted our city. For on a comparison of the ten years just elapsed with the ten preceding that epoch, the ratio of the former has been 68.49 per thousand, while the latter has been but 47.50, or an increase of nearly 50 per cent. Surely if any mistake should exist as to *one* of the alleged causes to which the influence has been attributed, *some* of them *must* have been the physical agents of this enormous augmentation, and enough certainly are present to alarm the public in relation to that fearful future which all cannot avoid.

A further draining and clearing even to the lake and extending above and below the city, is deemed essential for the permanent advantage of our sanitary relations. But then it should be all done under the careful lights of experience, science, and skill. Let it not be supposed for a moment, that physical improvements are to be condemned because hitherto they have been so inadvertently made. On the contrary, seasonably and properly executed, the most permanent and lasting benefits must accrue; or all anterior experience elsewhere is but a common liar; the city has not been doomed by the curse of God—but by the wilful ignorance of man. What right have we to claim exemption from the operation of those laws applicable to all similar localities? Is it not like throwing defiance in the face of Deity? Will not the penalty be exacted of us as of all for the infraction of laws He has imposed everywhere for our guidance and our good? It is the part of true wis-

dom to look upon the past as a great lesson; its teachings will be valuable if viewed in that light. The thousands of dead which should have been saved to friends, home, country; the millions of money lost to the city, constitute too bitter an experience to be altogether lost.

Such is a brief exposition of IMPROVIDENT LEGISLATION and its effects here; it has left its indelible mark on the records of the past. Proper sanitary legislation should fulfil the great demands of a people suffering under remediable ills. All that has been done with this view heretofore, has been the occasional appointment, at long and distant intervals, of bodies, ycleped "Boards of Health," without personal or corporate permanency to acquire that experience to this *here* recondite department of science; with very restricted, and usually without any means, and with advisory powers only, and whose advice was rarely, if ever, asked for or taken. Any other direct sanitary legislation is in vain sought for on the statute book. But it may be asked, why should it not be on the statute book? Is it not time that sanitary measures should be entitled to the consideration of this people when that is the ONLY barrier left to her prosperity and progress, and when she has been laboring under legislative empiricism, that would have ruined any other country on the face of the earth, for more than half a century. But, fortunately for our argument and our proof, we are not left in the mazes of doubt on this subject. Those who have cultivated that department of medical science, termed life knowledge or public hygiene, know that there are certain tests through which it is ascertained whether any portion of a city or country has had due care taken of its sanitary relations, or whether they have been utterly neglected; these are, when, on an average of years, it shall have been subjected to a mortality exceeding 20 in a 1000, or 2 per cent. of its population, it has suffered under *remediable ills*. You have seen above, that for the last ten years our city has exceeded that more than three times over. And, again, diseases have been divided by vital statisticians into two classes, the preventable and the non-preventable. The first only is a subject of legislation, and embraces what is called the zymotic class (of epidemic, endemic, and contagious maladies); here, this class, in a series of years, has largely exceeded one-third of the entire mortality; in 1853, it was considerably over two-thirds! Hence the proofs are plain and irrefragable, that our city has suffered from both IMPROVIDENT and DEFECTIVE LEGISLATION; that we should now demand correction

and preventive measures, and that it is now time that the firm and cauterizing hand of science, experience, nay, of common sense, should be exercised in a crisis, to which folly, ignorance, and wilfulness has brought us. Fortunately for us, it has been clearly demonstrated, here and elsewhere, that all the ills under which our magnificent position has been so long laboring can be corrected, if our people would arouse themselves from their unaccountable lethargy on this subject, and take the initiative at last, and do duty to themselves. Surely, health and life are as much the subject of control and legislation, as much worthy and demanding the care of civil government, as property and political rights. For it is the very essence of and gives rise to all government; that man in aggregating together to form society, abandoned, or put under the control of the body politic, a certain portion of his natural rights, that he might be protected in the enjoyment of the remainder. Now, no one will dispute that the right to the enjoyment of health and life are the most important of all the rights that require protection. Thus I cannot go into my neighbor's yard and abate a nuisance which is offensive, and poisoning the air of the vicinity; I cannot afford to clean the streets or the river banks, or fill up lots, make drains, and abate all the thousand nuisances which tend to deteriorate the health of the community, injure the reputation and commerce of the place, make every commodity dear, and lower the value of my property; this is the business and duty of the city government, and it is for these that we submit to be burdened with a taxation, which, while it shows the enormous amount we are made to bear, shows, at the same time, the elastic power of our people; and to what extent, under proper economy, direction, and management, these apparently exhaustless resources could be used to build up a great emporium, surpassing in destiny and equalling in splendor any city in the world.

This subject has been long dear to me, because I plainly saw through it immeasurable benefits and amelioration to the city, as have everywhere followed intelligent application of sanitary principles elsewhere. To abandon it as hopeless would be to take leave of a most deeply cherished object. I have long flattered myself that time and reflection, in view of past consequences and the brilliant future dependent upon a change, with the sanguine temperament belonging to our countrymen, would ultimately produce that conviction on the public mind necessary to effect it. I may have been mistaken. Although a drop of water falling on the solid rock,

will in time wear it away, human perseverance must have a shorter limit. Unpalatable truths of past references shut the eyes and close the ears to its better teachings, and, like the Muezzin's cry from the steeple the hour of prayer, will be unheeded. However such are the fate and fortunes of man; blessings easily attained are of little estimation, although within reach of the hand ready to pluck them; while those of difficult acquisition are esteemed of inestimable value, and sought after with toil and avidity. "Mankind," in the language of Sydney Smith, "seems to object to every species of gratuitous happiness, and to consider every advantage as too cheap, which is not purchased by some calamity."

REPORT

ON

STRYCHNIA:

ITS PHYSIOLOGICAL PROPERTIES, AND CHEMICAL DETECTION.

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STRYCHNIA: ITS PHYSIOLOGICAL PROPERTIES, AND CHEMICAL DETECTION.

THE alkaloid Strychnia was discovered in the year 1818, by Pelletier and Caventou, of France. From that time down to the present it has attracted much attention, from the medical profession, on account of its peculiar action on the animal system, its employment as a remedial agent in certain forms of disease, and its occasional use as an efficient and certain poison by suicides. Much has been written on the subject, but not collected so as to form a connected account of its properties. Indeed our knowledge of the properties of Strychnia is, as yet, comparatively small, and it is only proposed to collect, in this paper, what may be relied upon as accurate and true so far as the physiological properties and chemical detection of this powerful alkaloid are at present known.

However admitted into the system, it acts by entering the circulation, and in this way is carried directly to the nervous centres, whence its peculiar effects are transmitted then to the muscular system. When injected in the veins it acts most promptly and energetically. This was fully established by Vernière, in the year 1827, as quoted by Pereira,[1] in an experiment showing that the blood acquired poisonous properties from its presence. Vernière states that, the extract of nux vomica being inserted in "the paw of an animal after a ligature had been tightened around the leg, so as to stop the venous, but not the arterial circulation of the limb, blood drawn from an orifice in a vein between the wound and ligature, and transfused into the vein of another animal, will excite in the latter the usual effects of the poison, so as even to cause death; while on the contrary, the animal from which the blood has been taken will not be affected at all, if a sufficient quantity is withdrawn before the removal of the ligature."

[1] Mat. Med., i. 153.

Since Vernière's experiments, however, others have been performed by distinguished physiologists in France, and its action on the system, in consequence of its admission into the circulation, seems no longer to allow of cavil. At one time, the doctrine of sympathetic nervous communication from the part with which it first came into contact to all other portions of the animal body, had gained considerable credence with the profession. The action was supposed to be somewhat like that of electricity on the vital economy; that as soon as the local effect was produced at one point, this constituted the centre from which irradiated general effects over the whole muscular system. Such an explanation was a mere crutch, seized by the physiologist to aid his tottering steps over difficulties, through which his knowledge did not enable him to pass safely. To be satisfied with this, would prevent that careful chemical examination that now enables the experimenter to detect the poisonous agent in the viscera, in so many cases, and by sure and reliable tests to prove its identity. Admit such a theory, and Flandin has truly said, "c'est declarer le poison introuvable dans le corps de la victime." But the results of many examinations have shown, in the expert hands of various chemists, that it *can* be detected in *various* portions of the body after death, and thus is great probability conferred upon the theory of Vernière, that by means of the blood alone does it reach the great nervous centres, and its effects on these are then manifested by all the muscles which derive their nervous fibres directly from them.

Admitting that it enters the circulation, the question for our examination is, in what way does it produce its effects? Has Strychnia any property of *locally* affecting the organs of the body, or do not its effects proceed from some peculiar action it produces on the nervous centres? Ségalas[1] thought that it acted directly on the heart as well as on the nervous system, and endeavored to substantiate this by the fact, that "the heart of an animal poisoned by strychnia or brucia was insensible to the galvanic current." Flandin shows how the very fact that the blood is poisoned by strychnia would make it less fitted to preserve the movements of the heart, and that the destruction of its sensibility must necessarily result from the action of an agent that seemingly first excites the bodily functions and afterwards depresses them.

The effects produced by the action of strychnia manifestly pro-

[1] Flandin. Toxicologie, iii. 249.

ceed from its action on *the spinal column;* and this is not generally of such a nature as to exhibit any visible alteration even to the scrutinizing examination of the microscope. The muscular system is thrown into violent tetanic action, resulting in decided opisthotonos, and, notwithstanding this, the cerebrum seems but slightly affected, since the mind of the person, laboring under these violent convulsions, may be perfectly clear and undisturbed. His intellectual faculties will be unimpaired by the action of the strychnia, and rational answers will be quickly given in reply to all questions propounded to him. The effect must be slight on the cerebrum, and the whole force of the poison is expended on the medulla oblongata and the medulla spinalis. Magendie proved this years ago. An animal might be decapitated without preventing manifestations of tetanic action after strychnia had been taken, but the destruction of the spinal cord at once checked all manifestations of such action. We should go too far, however, if we were to conclude that there is no effect produced on the cerebrum by strychnia, since the organs of special sense become peculiarly sensitive. There is an exaltation of their powers. The eyelids are closed as though to shield the eyes from an intense glare of light; the ears become appreciative of the slightest sound that is made in the room; and occasionally cases occur where there will be loss of consciousness, as in the first one related by Orfila, where a young man having taken strychnia exhibited at times a perfect want of consciousness. *During* every violent paroxysm there will be a temporary loss of consciousness accompanied by a cessation of the act of respiration; the wide opening of the eyelids and extreme dilatation of the pupils. These symptoms are accompanied with what Orfila called a "véritable état de mort apparente avec les caractères de l'apoplexie portée au plus haut degré."

As another indication of the exaltation of the special senses, it may be mentioned that the sensation of touch is made painfully acute, and the slightest contact of a foreign body at once produces convulsions more or less powerful. The effort to raise the eyelid has produced a spasmodic action, which seemed to run through the whole system with electric rapidity. These facts, however, only show that while the powerful manifestations of its peculiar actions are shown in the derangement of the functions of the spinal column, yet the whole nervous system is at the same time more or less affected.

Authors have agreed that strychnia produces no changes in the

blood disks, and yet some change must be produced of an important character in the constitution of the blood. Magendie affirmed that there was perfect liquefaction of the blood after death by nitrate of strychnia. Orfila notices that on opening the vertebral column, "there ran out nearly 1 kilogramme of thick blood, very black, viscous, and non-coagulable, which stained the hands;" and that various plexuses of veins were *distended* with dark *liquid* blood. In the case of Dr. Gardiner, the anatomists reported that, "on removing the brain by the necessary division of the medulla spinalis, there was a very copious *flow* of highly carbonized blood from the base of the cranium and the spinal canal." Flandin states that the blood remained fluid in his experiments on animals poisoned by means of strychnia or brucia; and Blumhardt, in his published case, notices the same fact. Indeed, so frequently has this been observed, that we should be justified in expecting to see the blood in a liquid condition in every autopsy made of an individual destroyed by the action of strychnia. This blood has not thus far been examined by the microscope so as to refute or establish the opinion of Müller and Stannicus, with reference to the non-alteration of the blood disks. The liquidity may fairly be presumed to be similar to that found in cases of sudden death by electricity or other causes, acting on the body in full health.

The whole appearance of the body, on the minutest examination after death, fails to present changes adequate to the explanation of the violent symptoms. In this present condition of our knowledge, we are only able to sum up our acquaintance with the modus operandi in the few words, that strychnia acts by entering the circulation through absorption, exerts its influence most prominently on the spinal axis, and to a certain extent also, on all parts of the nervous system, and that animals destroyed by it do not exhibit lesions sufficient to account for the symptoms, although their veins are generally found engorged with dark liquid blood, viscid and non-coagulable.

The effects of this agent, when given in small doses repeated at regular intervals, are of a tonic character. For this reason it has been resorted to in certain forms of dyspepsia, especially where this is dependent on a want of tone in the stomach, and in pyrosis arising from mere "functional disorders of the stomach." Various authorities are cited by Pereira as supporting its use in cases where dysentery and gastrodynia have proven intractable to remedies. Its efficacy evidently depends on the gentle stimulus it gives to the

nervous system, which then in turn affords that necessary stimulus required by the muscles in order that their functions may be thoroughly performed. An experience of some years with the profession of this country and Europe seems to have approved and justified its use for this purpose.

Trousseau employed nux vomica in cases of impotence with considerable success, and though the effects were not permanent, yet its efficacy in temporarily removing the impotence was such that he continued to employ it for this purpose with both sexes. Where impotence exists from want of nervous energy, the strychnia appears to induce the necessary stimulation required by the organs of reproduction.

The second effect of strychnia is the production of a contracted state of the whole muscular system. The body assumes a tetanoid condition. There is a super-excitation of the nerves proceeding from the cerebro-spinal axis. We often have opportunities for witnessing this convulsive muscular movement, in cases of those who have been employing strychnia for the purpose of stimulation in "torpid or paralytic conditions of the motor or sensitive nerves of the muscular fibre." Increased sensibility of touch will be perceived. The contact of a slight breeze becomes painful, and that of a solid body produces shuddering and spasmodic movements. The gait is feeble and tottering, and a general tremor pervades the whole body on attempting to walk. Pereira speaks of being able often to recognize its effects on the muscular system, before the patient has noticed any peculiar symptoms, by tapping him suddenly on the ham which would induce a slight convulsive paroxysm. Such patients, when under the operation of this agent, undergo considerable mental agitation, at the appearance of these convulsive movements.

Closely following this condition of the system, is the commencement of convulsions without any adequate cause. The will seems to lose all command over the voluntary muscles, and the hands and legs move in spite of all determinations, on the part of the patient, against motion. There is an indisposition to voluntary motion of any kind, and rest on the back is generally preferred. Such an excitability of the spinal cord has been established, that the slightest impression from without, may be exaggerated by this excitable condition into a reflex action of a violent character.

The cerebrum, however, soon begins to evince some slight proof of the action of strychnia on it. There is an anxious expression

of the countenance, and general depression of spirits. The organs of special sense also become very acutely sensitive. But with all this excitement, the mind is able to think clearly and deduce conclusions from premises, with as much preciseness as at any other time. Indeed, in the case of Dr. Gardiner, which will be given in full, further on, there was the most decided manifestation of an intention to deceive, as to the substance taken for the purpose of destroying life; and to suggest another cause for the abnormal symptoms which presented themselves, and this was carried out even to the last paroxysm which closed his life, accompanied by repeated denials, that he was suffering any pain. The denial of sensation of pain was so opposed to the tetanoid condition of the body, that one could only conclude, that it proceeded from a fixed determination not to evince anything like complaint during the deadly action of the strychnia.

This *slight* action of strychnia on the cerebrum may, seemingly, be contradicted by certain post-mortems, which have revealed a ramollissement of the brain. But these cases have clearly shown that this ramollissement is the result of a species of inflammatory condition which the strychnia has established around some apoplectic clot, or deposit in the brain. The rule is, that the mind, during the influence of strychnia on the body, is clear and active.

With all the symptoms we have just described, no indication will be afforded by the arterial circulation that anything of a special character is producing secret, but powerful effects on the system. The pulse will scarcely be at all quickened—but will beat with about the same frequency it would exhibit were the individual in a deep and profound slumber. In Pierre Daste's case, quoted by Orfila, the pulse was said to present no remarkable alteration, and this is the statement with reference to nearly all the cases of which we have any published accounts. Occasionally, a slight reduction may be perceived in frequency and volume; but as a general thing no remarkable alteration of the arterial circulation will be exhibited.

The tetanic symptoms continue to come on with increased force, on the contact of any excitant, if the quantity taken has been sufficient, and at length the full effect of strychnia establishes full tetanus. At first there is a shuddering movement of the muscles, which increases until opisthotonos is produced. The back is strongly bent, so that the body is supported on the occiput and the heels, and the extensors of the lower extremities are thrown into a state

of rigid contraction. The arms become stiff, with the hands generally firmly clinched. The muscles of the chest and diaphragm are so strongly contracted, that air is prevented entering the lungs, the circulation is checked, the face becomes livid, or even of a black color, from the enormous engorgement of its vessels, and the lips are puffed out. The impression produced by these appearances is, as though the air were being driven through the mouth, on account of some enormous compression, applied to the diaphragm, operating upwards, and to the anterior walls of the chest, working backwards—and both uniting to express all the air that might be contained in the lungs. This condition may pass off, and all indications of tetanus disappear. If such an interval, as is most likely, occurs, there will be during its continuance no feeling of pain, no convulsive movement on contact with foreign bodies; but a general feeling of weakness and exhaustion will be experienced, inducing the individual to seek sleep. The thoughtless observer might conclude the danger was over. The calm, however, is deceptive. Soon the excitable condition of the system is again noticed—more sensitive indeed than before; all the organs of special sense become exceedingly acute. This state of things terminates in another violent tetanic spasm. The interval may be only from ten to fifteen minutes, or as long as an half hour; and the duration of the tetanic attack varies from one to three, or even five minutes. Each attack, however, leaves the sufferer more prostrated and exhausted than its predecessor, and finally death takes place during a paroxysm, or from extreme exhaustion. In the former case, the state of perfect asphyxia is induced. It is remarked by Carpenter,[1] of tetanus in general, and it is true of this particular form of that disease, that "the functions of the muscles controlling the various orifices, are those most affected; and it is by the spasm affecting the organs of respiration and deglutition, that life is commonly terminated."

This range of symptoms, from slight tonic effects on the digestive organs, up to the powerful agitations produced by tetanus, is very extensive, and the whole are rarely seen in cases where strychnia has been employed as a poisonous agent, inasmuch as a sufficiently great quantity is generally taken, so as to bring on speedily the violent and peculiar effects which are comprised in the word tetanus.

It was denied for years, that strychnia could exhibit any cumu-

[1] Hum. Phys., 702.

lative effects on the animal system, but the case described by Mr Cooper,[1] seems to show that such effects are exhibited by it occasionally. A Swede had been treated with strychnia for a species of general paralysis; one-eighth of a grain was given three times a day for several weeks; this was increased to one-fourth of a grain, and afterwards one-half a grain was given with the same frequency for several days. But one morning he was found in a fit, insensible, his face and chest of a purple color. There was cessation of respiration and but feeble movement of the heart. All the indications of full tetanus had been produced. These passed off, and a short period of comparative freedom from pain then occurred, followed, however, by a still more violent paroxysm and death.

The diagnosis of a case of poisoning by strychnia,—its difference from a case of idiopathic tetanus is theoretically not very difficult to determine, but in practice, many difficulties present themselves. The symptoms necessarily come on more slowly in idiopathic tetanus than under the action of the poison, and in the latter case they can *generally* be traced as having some connection with articles of food or drink that have been taken. But if the person affected be disposed to deceive, there can be no assistance obtained in this way. In practice so far we have only been able to decide by antecedent and concomitant circumstances.

With reference to the treatment of cases where poisoning has been produced by strychnia, very little can be offered which may be considered as valuable by way of antidote. Lard has been proposed as an antidote, but there has been no definite conclusion arrived at as to its efficacy, and the opinion, based on experiment, is now that it is unreliable. The suggestion is due to Dr. Pindell, an American. It has attracted the attention of various toxicologists, and experiments have already been performed, and more doubtless will be undertaken, with the view of satisfactorily determining so important a matter. Camphor was announced as an absolute antidote, but experience has demonstrated its unfitness for such purpose. Conia, on account of its therapeutic properties being the opposite to those of strychnia, has however more claim on our attention. We doubt, however much may be said of these antidotes, whether it is possible to check the progress of the deadly effects of strychnia, when *it has once entered the circulation*; when it has once produced that change in the qualities of the blood which

[1] Pereira, Mat. Med., ii. 548.

cause it to engender such abnormal excitation of the nervous system. *Before* the strychnia has left the stomach, nothing could be more efficacious than an emetic, and therefore antidotes would be unnecessary. Judging from the case the writer had an opportunity of seeing, there seemed to be no hope after the full symptoms of tetanus were developed.

In order to exhibit the effects of strychnia on the system, or in other words, to show its toxicological effects, two cases are now given; that of Pierre Daste, as given by Prof. J. Cloquet, where the patient lived nearly three days; and that of Dr. Gardiner, who died within three hours and a half. They will exhibit the varieties of symptoms, which have been noticed in cases of poisoning, and will serve to substantiate the statements made in the first portion of this paper.

"Pierre Daste,[1] aged 45 years, of a bilious temperament, took at 9 o'clock in the evening of June 13, 1820, a considerable quantity of bruised nux vomica. Almost immediately after the ingestion of this poisonous substance, he was seized with violent convulsions. He was made to vomit by the administration of milk and warm water. At 10 o'clock, when removed to the Hôpital Saint Louis, his features were greatly altered. Convulsive paroxysms occurred at shortening intervals; their duration being from one to two minutes. They were marked by a rigorous stiffening of all the muscles; the trunk and limbs were violently extended, and the jaws were forcibly closed. The patient uttered broken shrieks and implored prompt relief. The pulse presented *no remarkable alteration*. During the night, *the senses of sight and hearing acquired exaggerated sensibility*. Such was the excitability of the muscles that it was only necessary to touch the patient in order to produce convulsive movements; and the slightest touch only was required to produce this effect. *During* the convulsions the pulse was frequent and agitated, and the patient was bathed in perspiration.

"On the 14th, at 7 A. M., the condition of the patient was more calm; the convulsive movements were less frequent, not so long, nor so violent. * * The pulse presented no febrile agitation. There was a general feeling of weariness and as though bruised over the whole body, but with no pain in the abdomen. At 9 A. M., the convulsive movements had ceased; the storm, so to speak, had disappeared, and everything seemed to foretell a happy termination.

[1] Orfila, Toxicologie, ii. 605; Flandin, iii. 201.

The insidious calm continued during the rest of the day and night.

"On the 15th, there was the same freedom from convulsions with a sensation of feebleness and general languor. Some pain in epigastrium in the evening. Skin dry and pulse frequent.

"On the 16th, at 6 A. M., the pulse was small and almost imperceptible. There were dryness and heat of the skin, redness of the borders of the tongue, violent pain in the epigastric region, palpitations, dejection, extreme prostration, regularity of the intellectual functions, staring eyes, and altered features. Death occurred at 11 o'clock A.M. There was no stiffness of the limbs, and a viscid moisture covered the whole body.

"In the autopsy, 48 hours after death, no appreciable alteration was noticed in the meninges of the brain and the cerebral pulp. There were some adhesions between the pulmonary and costal pleuræ; lungs engorged with blood, principally at their base, which looked as though it were painted red. There was a violet color pervading nearly the whole skin, but the shade was more distinct in the lowest parts where the blood had collected on account of gravity." * *

Death seems to have occurred, in this case, *from the exhaustion produced by the previous convulsions*, and from which Daste did not rally.

The case of Gardiner shows more clearly and distinctly, than any other case which has thus far been presented to the notice of the profession, the legitimate effects of strychnia on a constitution in full health.

Dr. George A. Gardiner was convicted in Washington, on the 3d of March, 1853, of the charge of false swearing, after a protracted trial, and was immediately sentenced to the penitentiary of the District of Columbia for ten years. Shortly after the rendition of the verdict, he was observed to take some water from a glass. At this time, it is supposed that he slipped a small paper package, containing strychnia, in his mouth, and swallowed package and contents, as a paper wrapper was afterwards found in his stomach. This was probably about 12 o'clock M. From the court-room he was taken to the jail, and the Deputy Marshal states that he threw up the window, as Gardiner seemed to be suffering from heat, and gave him a glass of water, in accordance with a request made by him. Shortly after this, while attempting to raise a second glass to his mouth, he fell on the floor in a violent convulsion. The attendants raised him

from the floor and placed him on a cot which had been brought for the purpose. They spoke of noticing that "he was nervous."

The resident physician of the Washington Infirmary, Dr. Hellen, having been called in to see the case, the writer accompanied him; and from fifteen minutes before 1 o'clock until his death, the case was under his observation. Gardiner lay on the cot perfectly quiet at first; face somewhat flushed, pulse regular and about 90 to the minute. Upon inquiring whether he ever had suffered from an epileptic attack, his brother replied, "Yes, on several occasions," and that the first one was produced by a fall in a Mexican mine. On conversing with Dr. G., he objected to taking some brandy which had been sent for, and said, "Don't give me any stimulus," but consented that cold cloths might be applied to the forehead and temples. Twitchings of muscles began to present themselves, and spasmodic movements of the arms were occasionally observed. On his eyelids being touched, with the view of examining the pupil, a tolerably strong paroxysm was produced. His eyelids, it is proper to mention, were closed all the time, as though the light, which poured through the jail window, was intolerable. In fact the lids were only separated during the convulsions, and then the pupils were widely dilated. His hearing was very acute, and remarks made in a very low tone of voice were replied to quickly.

The extremities now began to move spasmodically, and the whole system seemed to be under the influence of a potent poison. A violent tetanic convulsion occurred, in which the body became quite rigid, the extremities violently extended, the hands firmly clinched, the lips puffed out, and frothy mucus protruded, driven out as it seemed by some enormous force which was producing the total expulsion of the air from the lungs; the hands were of a dark blue, nails blue, face livid, and features horribly distorted. The pulse was very feeble, and hardly perceptible. The convulsion soon passed off, with, however, no decided freedom from the tetanoid condition. Some relief seemed afforded by applications of strong mustard plasters to the ankles.

Dr. Hall arrived about 1½ o'clock P. M., and was with the patient until within a few minutes of his death, giving such medical directions as his own experience seemed to suggest. On asking Gardiner, through his brother, "whether he had taken any poison?" an emphatic "No!" was the answer. He also denied that he suffered any pain, and appeared resolutely determined to suppress anything resembling complaint. His mind was perfectly clear. There were

no indications of even the slightest derangement of his intellectual faculties. The convulsions affecting his arms were so frequent and repeated, that a person was on each side, holding his hands, at his request. It seemed that a mere touch was more of an excitant than a firm grasp of any part of the body. He called the writer, and said, with some emphasis: "If I die, I die innocent."

On endeavoring to remove his boots, so as to plunge his feet into hot water, violent convulsions were produced, and every indication of agony was manifest on his countenance. His limbs were so firmly and stiffly extended, that it was impossible to do more than semi-flex them, although the toes were somewhat limber. After the feet were in the water some five or six minutes, there was a relaxation of the spasms. But the tetanoid condition gradually came on again, and a most violent paroxysm ensued. There was considerable frothing at the mouth, complete opisthotonos, lividity of the face, entire cessation of respiration, and of the movements of the heart. He was thought dead for the moment by all around him. Gradually, however, the circulation seemed to be re-established, and the respiration to become easy and regular. As the convulsive movements ceased he became calm, and expressed a wish to be left alone, so that he might sleep. Soon, however, the tetanic symptoms again presented themselves, and another, though less violent, attack was experienced. He was much exhausted, as might have been expected, from the immense strain the muscular system had been subject to, but he continued to answer "No!" to the question whether he felt any pain. The strength of will, as exhibited in preventing the utterance of expressions of pain, was most remarkable, and probably has never been exceeded in the case of any suicide.

The physician to the jail, Dr. Semmes, arriving at 3 P. M., the case was placed under his charge. No peculiar symptom of interest was presented from that time up to twenty-five minutes past three, when he died. There would be slight intervals, lasting for a few minutes, of freedom from spasmodic action; and then a recurrence of spasm, until, finally, a violent convulsion ensued, in which the body became very rigid, the extremities violently extended, face livid, changing to a pale and somewhat bloodless hue, eyelids opened widely, and pupils dilated. The paroxysm was protracted longer than any of those preceding it. Exertions were made, in various ways, to re-establish the circulation, and overcome the spasm. All efforts, however, were in vain. Death ensued in some

what less than three hours and a half after the poison had entered the stomach. An autopsy was held eighteen hours after death, and, from the notes of Drs. Miller, Semmes, and Stone, the following is extracted:—

"*External appearances of the body* rather emaciated. Face, neck, and back, livid; front of the body waxy and pallid; body extremely rigid; deep indentations on the right forearm, from the pressure of the indicator, medius, and thumb, of the opposite hand; articular abrasion of the left leg, in the anterior and internal tibial region, about five inches long by one and a half inches wide; fingers and thumbs were very livid, half-flexed, and slightly elastic.

"*The Head.*—Scalp much congested; the diploe congested, and a discharge of serum as soon as the saw had passed through the external table; meninges of the brain highly congested; the tissue of the brain and spiral marrow presented no abnormal appearances; the arachnoid a little milky in parts. A few minutes after removing the brain, by the necessary division of the medulla spinalis, there was a very copious flow of highly carbonized blood from the base of the cranium and the spinal canal. There was also a trace of a turgescence of the velum interpositum and choroid plexus, hardly worthy of notice. The investing membrane of the upper portion of the medulla spinalis, at its junction with the medulla oblongata, appeared to be slightly vascular.

"*The Thorax.*—Heart small, contracted, and contained no blood. Perfectly normal."

The liver was normal and healthy in appearance, as also were the spleen and the pancreas. The kidneys were, however, highly congested.

On examining the clothing of the deceased, a white powder was found in one of the pockets. This was determined to contain commercial strychnia, or a mixture of strychnia and brucia. The qualitative analysis of the contents of the stomach, made by Dr. Breed, of the U. S. Patent Office, and the writer, furnished satisfactory evidences of the presence of strychnia, with some traces of brucia. There was also found in the stomach several pieces of paper, folded in the form employed by druggists for putting up powders, and comparing in size with the package found in the pocket of the deceased.

Comment is deemed unnecessary on this case, as every professional man will recognize at once the correctness of the verdict of the coroner's jury, that Dr. Gardiner came to his death by strychnia.

II. It is only proposed, in the second part of this paper, to notice the three different methods which have been proposed for the detection and determination of strychnia, when mingled with animal matter. Two of these only are strictly chemical, the third being based on its physiological properties. For a long time, it was believed to be impossible to separate organic alkaloids from animal mixtures without their unavoidable destruction by the heat to which it was thought necessary to subject them. This idea was dispelled when scientific toxicologists commenced examining carefully the processes which would be necessary to effect the elimination.

The difference in two of the processes depends on the method adopted for the purpose of removing the animal matter present. Orfila employed acetic acid. The suspected mixture was treated with acetic acid, filtered, and then evaporated to dryness. The residuum was drenched with alcohol, and, after a second filtration, was evaporated and treated with the proper reagents; or it was again treated with acetic acid, and the acetate thus obtained was employed for the tests. It is evident that the alkaloid must be present in comparatively large quantity, in order to obtain the desired result. The process will answer if such be the case, and, in the examination of the contents of Gardiner's stomach by this method, there was no difficulty in obtaining satisfactory results. This process is, however, not the most delicate, and the alkaloid would be apt to escape detection were it present in very small quantity. It is necessary, then, to resort to the second process.

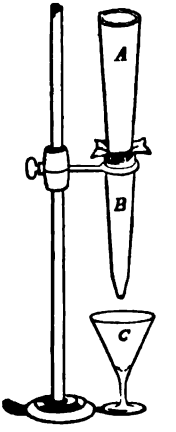
Orfila, in some of his experiments, employed animal charcoal as a decolorizer; and it is evident, from the peculiar properties of this substance as an absorbent of the alkaloids, that small quantities would be retained in the process of filtration, and thus the process itself would prevent the detection of the poison. Indeed, Orfila seemed to be conscious of the want of delicacy in his process, since he says,[1] "one should be circumspect when he pronounces on a case of poisoning by this alkaloid, and great account should be made of *the symptoms* which were experienced by the person."

The simplest process, and, at the same time, that which is most reliable, is Flandin's (*Toxicologie*, par C. Flandin, iii. 254). He availed himself of the fact that a temperature of 100° C., will not affect the chemical constitution of strychnia, although it will render all the animal albuminous matters present in the mixture insoluble,

[1] Orfila, Toxicol., ii. 595.

and will thus prevent them from interfering with the solutions we are hoping to make of the suspected strychnia. The addition of caustic baryta or lime to the animal material, will then cause the conversion of this into other compounds, and into soluble and insoluble soaps. All that would be necessary after the employment of the caustic alkaline earth, would be to employ a proper solvent for the alkaloid.

The process in the case of a suspicion of strychnia in animal matter, is as follows: the suspected organic matter is exsiccated in a water-bath, mixed with caustic lime (12 parts to 100), and well rubbed together in a mortar. This mixture is exposed in a water-bath, and the whole is subjected to the action of heat until it is reduced to a pulverizable form, which is then removed, and, after being reduced to a fine powder, is three times heated along with boiling alcohol, and subjected to filtration after it has become cold, when it will be found almost colorless. Now it is evaporated, and the residuum is treated with ether, to remove the fatty matter; this solvent is employed, since the alkaloid and its almost constant associate, brucia, are insoluble in ether. After the removal of the clear ethereal solution, the alkaloids (if present) will be found in the filter either pure or mixed with foreign matters. In the latter case, it will be necessary to treat the solid residuum with acetic acid, dry over a water-bath, and dissolve out by means of water. The acetate of strychnia has its base precipitated on the addition of ammonia, and the precipitated base caught on the filter of Danger, will give the reactions marking the alkaloid. Danger's filter is composed of two tubes—A, the upper, is of a conical shape, and fits into B, which is of a little larger bore. A circular piece of moistened filtering paper is placed over B, and A is then fitted in, holding the filtering paper in its place. The liquid to be filtered is then poured into A, and the solid matter is deposited on the paper as the liquid passes through it in its passage to C.



The physiological method of detecting strychnia has been lately suggested by Dr. Marshall Hall,[1] of England; it consists in em-

[1] Chemist for March, 1856, p. 382.

ploying live frogs, which seem to be most readily excited by the influence of strychnia. Dr. H. found that in the course of two or three hours' immersion in any liquid containing strychnia, the animal would be seized with general spasms, accompanied by tetanoid rigidity. One-hundredth of a grain of the acetate was readily detected in one experiment, and in some others, the one-five-hundredth, and even the one-thousandth of a grain produced the specific effects.

Necessarily the successful application of this test would not *positively* prove the presence of strychnia, but would furnish strong probability of its presence. Where chemical tests, which are necessarily less delicate than this, fail, its employment would be exceedingly useful in a medico-legal point of view, as corroborative of an opinion based on the symptoms exhibited by the person antecedent to death. No positive evidence can be given by a chemist of the presence of any toxic agent, unless he has separated it in one of its definite forms. Such cases may occur where strychnia is present in exceedingly minute quantities, and this physiological test would then become desirable presumptive proof.

Dr. Hall suggests the employment of this test as follows: "In cases of suspected poison from strychnia, the contents of the stomach and intestines, and the contents of the heart, bloodvessels, &c., must be severally and carefully separated, and made to act on lively frogs just taken from the ponds or mud. I need scarcely say, that taken in winter, the frog will prove more strychnoscopic than in summer, in the early morning than in the evening."

This suggestion is a very ingenious one, and has the originality which marks all the suggestions of the distinguished English physiologist.

NOTE.—The following notice of the action of the characteristic tests for strychnia, on that substance and its associate, brucia, is extracted from a highly interesting paper on the subject of nux vomica and its constituents, by Dr. Hirzel, of Leipzig.

STRYCHNIA.	BRUCIA.
When rubbed with sulphuric acid containing one per cent. of nitric acid, and a small quantity of the binoxide of lead, or the binoxide of manganese, it first assumes a beautiful blue, then a violet, a red, and finally a yellow color. This is a reaction capable of detecting 1-1000th of a grain. (*Marchand.*)	Rubbed with sulphuric acid and some of the binoxide of lead or mercury, there is formed a brown, amorphous substance, soluble in alcohol and of a bitter taste; and a blackish red substance insoluble in alcohol. (*Marchand.*)
With sulphuric acid to which a few drops of a concentrated solution of bichromate of potassa has been added, it gives the series of colors just mentioned, but in a still more distinct manner. (*Otto, Riegel.*)	A solution of brucia in sulphuric acid tolerably concentrated, mixed with a few drops of a solution of bichromate of potassa, becomes a pistachio-green, an active disengagement of gas taking place at the same time.
Diluted sulphuric acid, added to a mixture of chlorate of potassa and strychnia, and then warmed, gives on evaporation, a peculiar crystallizable acid—Strychnic acid. (*Rousseau.*)	

Dr. Day's Test.—The suspected powder is moistened with one drop of concentrated sulphuric acid, and then a drop of ferrocyanide of potassium is added, which will produce an intense *violet*, though there should be only 1-1000th of a grain present. This test is not interfered with as much as some others by the organic matter present.

PARTIAL REPORT

UPON A

UNIFORM SYSTEM OF REGISTRATION

OF

BIRTHS, MARRIAGES, AND DEATHS,

AND THE

CAUSES OF DEATH.

BY

G. S. PALMER.

PARTIAL REPORT UPON A UNIFORM SYSTEM OF REGISTRATION OF BIRTHS, MARRIAGES, AND DEATHS, AND THE CAUSES OF DEATH.

THE Committee appointed "to report upon a uniform system of Registration of Births, Marriages, and Deaths," have been interrupted in their labors, in consequence of the death of their Chairman, Dr. M. W. Wilson; but in order to facilitate future operations, they respectfully report as follows: —

So far as your Committee have inquired into the subject, committed to their investigation, they find difficulties almost insuperable, to be overcome. The minds of the leading men in this country, as well as of the masses, are so much absorbed in commerce and the arts, agriculture, and politics, that it is almost an impossibility to turn them aside, and secure their attention and action upon a subject, whose results, however good and necessary for the progress of the race, are so remote, as are those of mortality statistics; they deem it better to transmit to posterity an account of stocks and merchandise than the births of their children, more important to record the destruction of their ships than the deaths of their fellow men. In most of the States nothing has been done in reference to this subject by either legislators or people, but in the larger cities and in a few of the States, laudable efforts are of late being made to improve this important branch of statistical information. Connecticut, Kentucky, and Massachusetts are among the most advanced, while Pennsylvania, for reasons best known within her own borders, has repealed her Registration Act.

The science of medicine and surgery, like the science of law, depends for its advancement, upon its established and recorded precedents; from the early and imperfect records in the temples of Æsculapius to the beautiful numerical tables developed in our

modern hospitals, statistical results have formed the true basis of both theory and practice. Nor are the statistics arrived at in these reports merely negative as to the treatment of disease; they show the numerous and varied outlets of human life, the epidemics, endemics, and contagions, and thus lead to an investigation of their causes and their cure. Hence they commend themselves to the whole community, the non-professional as well as the professional. Any source of intelligence, which shows the physical, moral, social and sanitary condition of a people, is of the most vital importance to every government; your Committee are of the opinion that the registration of births, marriages, and deaths, and the causes of death, will show these conditions most effectually, and as no reliable statistics can be procured to any considerable extent, by voluntary effort alone, they therefore recommend that the aid of laws be solicited to accomplish this object.

The following outline is submitted as the basis of a law to be proposed in each State, where the present law is defective, or where there is no law at all.

First. The secretary, or some other officer of State, shall prepare and circulate to the towns, cities, or counties, as the case may be, Blank Forms, for returns, based upon the system and nosological arrangement adopted in the preparation of the Mortality Statistics of the last census of the United States.[1]

Second. The birth of every child shall be recorded by the parent or owner of the child, stating distinctly the time of its birth, the name and nativity of both its parents, &c., whether the child be dead or alive, male or female, white or black, and whether it be the first, second, or any other number, by the same parents.

Third. Every marriage shall be recorded by the person who solemnizes the marriage contract, stating the names and nativity of both parties.

Fourth. Every death shall be recorded by the person having charge of the premises on which the death shall have occurred, and

[1] If it be compatible with the power and will of Congress, uniformity would be much better secured, if these forms could be prepared and circulated to the several States, by the General Government.

the record shall distinctly set forth the cause of the death, according to the certificate of the physician having had charge of the patient, or according to the best information which can be obtained, together with the name, nativity, age, sex, color, and occupation of the deceased; and these several records shall be given to the clerk of the town, city, or county, as the case may be, and he shall make a return of them, according to the Blank Forms which he shall have received, to the secretary, or other officer of State, who shall annually publish the same.

PRIZE ESSAY.

ON THE

ARTERIAL CIRCULATION:

ITS PHYSIOLOGY,

AND

CHIEF PATHOLOGICAL RELATIONS.

BY

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Una est Veritas.

PRIZE ESSAY.

ON THE

PHYSIOLOGY OF THE ARTERIAL CIRCULATION:

AND ITS

PRINCIPAL RELATIONS TO PATHOLOGY.

It is the purpose of this essay, less to originate or advance opinions, than to apply the test of rigid analysis to those in vogue; with the view of ascertaining the *precise truth*, in regard to a comparatively obscure domain of physiology and pathology. In this attempt, it will be the endeavor of the author to observe strict impartiality; while he assumes, of course, without preference, all risk of appearing in opposition to the prevailing current of opinion at the present time.

Although Henle has denied the existence of a muscular coat in the *arteriæ retinæ*, and Valentin omits the vascular apparatus from his enumeration of the localities in which organic muscular tissue exists,[1] it is to be considered as an established fact, that every artery has, besides other tissue, its portion of smooth muscle; and that the smaller vessels have a tunic almost entirely composed of this.

Kölliker[2] divides arteries, for description, into those whose middle tunic is *purely muscular*—of *muscular and elastic fibres intermixed*—or chiefly elastic; the former being the smaller, and the latter the larger arteries.[3] The only question among physiologists, at the

[1] Lehrbuch der Physiologie, Brinton's Trans., p. 367.

[2] Microscopic Anatomy, Philad. ed., p. 678.

[3] See, also, J. Hunter's works, for a similar classification, vol. iii. p. 164.

present day, is, with regard to the function and mode of action of this contractile tissue, so important elsewhere in its relations.

The design of the present essay is, to examine into the aspect of the question as it now stands, viewed in connection with the most modern physiological doctrines.

What do we *know* with regard to the normal contractility of the arteries in the living human body? Certainly not much, that is capable of demonstration, or unmingled with hypothesis.

We know of the pulse, as a phenomenon explicable, in the opinion of many, upon the supposition of elasticity alone, in the arterial system. We know of the arrest of hemorrhage after the division of a vessel, by retraction and contraction of its ends; and we know of the narrowing and occlusion of arteries, up to the nearest anastomosing branches, after ligation, for aneurism, or for other purposes. We know of the fulness of vessels in the erectile tissues, under their natural stimulation; of the throbbing of arteries of an inflamed part; of their dilatation in what is called chronic inflammation—and of the effect of cold and of astringents, in restoring their normal proportions after such expansion.

But, how many of these facts belong to the category of understood and explained events? None, if we except the retraction and contraction, and final sealing up, of the ends of a divided vessel. If we desire, therefore, to study in earnest the physiology of the arteries, we must find our data chiefly under the following modes of search: 1. Histological induction, in regard to the smooth or organic muscular fibre, elsewhere; 2. Analogy, from comparison of the circulation of other animals, of different types; 3. Observation of accidental and pathological deviations; 4. Experimental inquiries; and, lastly, Comparison of Theories, so as, by exclusion, to ascertain the balance of probabilities, and approximate to a demonstration.

I. HISTOLOGY.

Minute examination of the structure of all muscular fibre resolves it into fibrillæ, each composed of cells, which are cylindrical in the striated, and somewhat fusiform in the smooth muscle. The property of these cell-fibres is contractility; the only normal change which they undergo being the approximation of their walls in the direction of the axis of the fibre, so as to shorten it, and their

eturn, under antagonistic force, to the uncontracted condition. *The physiological property of muscle, is contractility;* I lay it down as a proposition clearly established, by the labors of Haller, Hunter, Weber, Bowman, Burnett,[1] and others, that no other endowment or functional capacity belongs to it.

As to the manner of contraction of muscular tissue generally, no experimental inquiries have been more minute and precise, and no conclusions are referred to with more deference by other physiologists, than those of Bowman. We may, therefore, be fully justified in taking them as our chief guide.

"In regarding contractility," says Bowman,[2] "as a property of the living muscular fibre *in general*, it is meant that it resides in it as a property without which it would not be muscle." "A distinction is required[3] between the contractile force and the contraction resulting from its exercise. The latter will be permanent, if no force from without be exerted to obliterate it by stretching; for *a contracted muscle has no power of extending itself:*[4] there is no repellent force between its molecules. From these phenomena, therefore, it is possible to eliminate the appearances resulting from a subsided force, and to judge of the mode and duration of action of the force itself. Thus sifted, they prove that, even when directly stimulated by water after removal from the body, a *muscle contracts in successive portions*, never in its totality at once; and that no particle of it is capable of exhibiting an active contraction for more than an instant of time." This is concluded in regard to both striated and non-striated muscular fibre; the most easily repeated experiments having been those made with striated muscle. As to the particular differences between the voluntary and organic muscles, the same writer remarks,[5] that "if a number of striped fibres are arrayed in a long series, and are contracted in succession (as in caterpillars), the resulting movement is vermicular; but in the higher animals it is only in the hollow unstriped muscles that this variety of contraction occurs." "The contraction of the muscles in question is always of the peristaltic character, by whatever stimulus excited. The contraction of the bladder, although very temporary, is probably of the true peristaltic kind. The more pro-

[1] Cell Theory; Trans. of Am. Med. Assoc., vol. v. p. 703.
[2] Todd and Bowman's Physiol. Anat., p. 169.
[3] Ibid., p. 172.
[4] See also Hunter's works, vol. iii. p. 150, for the same statement.
[5] Op. citat., p. 180.

tracted action of the *uterus* is undeniably so. In pregnant animals this may be as distinctly perceived as in the intestines."[1]

"The most satisfactory mode," observes Dr. Carpenter,[2] "of accounting for the rhythmical movements of the heart, appears to be in regarding them as an expression of the peculiar vital endowments of its muscular tissue; and to believe that, *so long as this tissue maintains its integrity*, and the other necessary conditions are supplied, so long is an *alternation of contraction and dilatation* the characteristic and constant manifestation of its vital activity."

"In the auricles of the frog's heart," states Valentin,[3] "we find that a bundle breaks off from one fibre to be applied to another. This course, which is the exception in striped muscles, is the rule for the unstriped variety." "In the striped fibres total contraction is the rule, and vermicular movement the exception. But in the unstriped fibres, the reverse of this obtains."

And, lastly, "The heart," say Kirkes and Paget,[4] "is quickest and most vigorous of all the muscles of organic life in contracting upon irritation, and appears in this, as in nearly all other respects, like the connecting member of the two classes of muscles."

With these quotations, we may consider ourselves to have fully established the authoritative exposition of muscular contraction, and its mode of occurrence in the unstriped as well as in the striped fibre. It will only be necessary to add, once more, upon this point, that Henle and Kölliker are universally acknowledged to have proved (as it had long before been supposed) that the contractility of the tunica media of arteries depends upon the presence of a layer of smooth muscle, variously intermingled with other tissue. Meckel describes the fibres of which this layer is composed as being disposed somewhat *obliquely* to the axis of the vessel.[5]

II. ANALOGY.

The extreme value of analogical comparison in all physiological inquiries, has been unequivocally fixed by the labors of Oken, Von Baer, Owen, Carpenter, and others. We do well, as it has

[1] See, also, Kölliker, Microscop. Anat., p. 103; and Carpenter's Princip. of Hum. Physiology, p. 318, *et seq.*

[2] Hum. Physiology, p. 471.

[3] Lehrbuch, Brinton's Trans., p. 366.

[4] Manual of Physiology, p. 382.

[5] J. Hunter's Works, vol. iii. p. 151.

been remarked, to "examine the animal kingdom as a *multi-une machinery;*[1] to contemplate it as a living totality, bearing the impress of a dynamic and material unity." We are assured of the accuracy of the opinion which considers functional and structural analogies as experiments performed for us by nature, free from many sources of fallacy which belong to vivisection and to other experimental physiology. *It is, in fact, in the establishment of general laws that Physiology, like every other branch of science, finds its development, and must attain its perfection;* and, when such laws have been definitely established, all particular instances must bear the *onus probandi*, should they present any apparent exception. With this elevated view of the prerogative of analogy, as not only an important, but the *most* important aid to inductive observation, in determining questions in natural science, we may look for a moment at the ideal modes by which the circulation of nutrient fluid is maintained in the different animal types.

In *Protozoa*, there is no distinct vascular system.[2]

In *Polyps*, an imperfect apparatus of longitudinal and circular vessels, with a capillary network.

An aquatic respiratory or water-vascular system only exists in most *Acalephæ*.

In *Echinoderms*, there is usually an arterial and venous trunk, with, in some species, an organ resembling a heart.

Helminthes present distinct vessels, the circulation being maintained either by the contractions of the body generally, or by those of the walls of the vessels.

In *Turbellaria*, an imperfect vascular system only is found.

In *Rotatoria*, only aquiferous and respiratory vessels, with pulsatile lobules.

Annelides have a complete closed circulation of colored blood; the principal vessels being dorsal and vertebral. These have varicose dilatations in their course. The leech has also lateral vessels.[3] The general direction of the current is from behind forwards in the

[1] T. Williams, Brit. and For. Medico-Chirurg. Rev., Jan. 1355. See, also, Cuvier, Introduc. to Règne Animal, p. 425.

[2] *Vide* Siebold, Comp. Anat. of Invertebrata, for the principal facts of the succeeding summary.

[3] J. Müller observed that, in the leech, for a certain number of pulsations, the middle and lateral vessels of one side contract together, and propel the blood into the other lateral vessel, and then the order is reversed; so that one lateral vessel is always dilated while the other is contracted. (*Cyclop. of Anat. and Physiol.*, vol. i. p. 651.)

dorsal, and from before backwards in the ventral vessel. Capi-branchiati often have two dorsal vessels. Acephala always possess a central contractile organ or heart, and arteries and veins, but no distinct capillaries. The blood passes from the arterioles into the parenchyma of the body, and returns from it into the veins.

In the *Ascidiæ*, the so-called heart is a long canal, whose pulsations, according to Siebold, "resemble the peristaltic movements of the intestine;" alternating, also, in the direction of the current.

Most *Cephalophora* have a propulsory organ or heart, as well as arteries and veins; but a very indistinct capillary system.

In *Cephalopoda*, the central organ of circulation is either round or oblong. A capillary system has been observed in Sepia, but is indistinct in this class generally.

Capillaries are also apparently wanting in the *Crustacea*; which cannot fail to suggest the probability of their veins as well as arteries being contractile. This probability is also supported by the analogous fact, established by the experiments of Dr. J. J. Allison,[1] that the larger veins pulsate in all the four classes of vertebrata.

The heart, in the lower crustacea, is sometimes spheroidal and sometimes elongated. In many of them it is tubular, and occupies a large portion of the anterior and middle regions of the back.

Myriapoda have an aortic heart, resembling the dorsal vessel of insects; being a more or less articulated tube, occupying the whole dorsal line. It is divided, by constrictions and imperfect muscular septa, into chambers, nearly as numerous as the segments of the body. *Each chamber is attached on each side to the internal surface of the segments of the body by triangular muscles. The diastole is produced chiefly through these muscles.*[2] I wish to call especial attention to this fact, as it has an important bearing upon the question how far active *dilatation*, in any muscular organ, is or is not a probability, according to analogy.

Arachnoidæ vary, in the grade of their circulatory system, from the possession of a heart, articulated dorsal vessel, arteries and veins, down to the absence of all of these, in lower species, with a mere irregular movement of the nutritive fluid by muscular and intestinal compression.

Insecta exhibit a contractile, articulated *vas dorsale*, and a cephalic *aorta*. All the venous currents empty into two lateral ones running

[1] American Journal of Medical Sciences, Feb. 1839.

[2] Siebold, op. citat., p. 337.

towards the posterior extremity of the body, and entering through lateral orifices into the dorsal vessel.

The dorsal vessel is constricted at regular intervals. It is attached to the dorsal wall of its segments by several triangular muscles, whose apices point outwards. Its walls contain both longitudinal and transverse fibres. The blood, after leaving the aorta, traverses the body in currents which are extravascular, bathing freely all the organs.

In all the *Vertebrata*, the vascular system is closed and complete, consisting of a heart, arteries, veins, and capillaries.

In *Fishes*, the single ventricle of the heart propels the blood at once to the gills through an arterial trunk, which presents an enlargement, or *bulbus arteriosus*, at its origin. After aëration, the blood is conducted by the branchial veins, so called, into the great systemic *aorta*, which distributes it to the different organs of the body. It is returned to the auricle by the systemic veins, which, before entering it, unite in a large dilatation, the *sinus venosus*. The heart, therefore, is altogether *respiratory* in this class;[1] must we not, then, apprehend the necessity of an added contractile propulsion of the systemic current by the aortic vessel, which receives the blood with but feeble impulse from the gills, and has to distribute it throughout the body? The transition from Cephalopods to Fishes is very gradual.[2] In the former, we may remember that the central propulsive cavity may be either spheroidal or elongated. The alteration in the case of Fishes consists chiefly in the more complete provision for aëration of the blood; while their portal and renal circulations are also peculiar.

But *Amphioxus* presents an exception which still more firmly rivets the analogy to the Invertebrata. In this species, the impelling power is not concentrated in a single organ, but is distributed among a number of separate pulsatile dilatations developed upon the vascular trunks. The venous system, also, has its pulsatile dilatations; a venous heart being developed upon the vena cava, or great dorsal vein, and another upon the vena portæ, which runs along the intestine on its ventral side.

In *Reptiles*, the ventricle of the heart is either single, as in Batrachia, or imperfectly divided. From this ventricle the truncus arteriosus distributes the blood by several arches, in part to the

[1] Carpenter, Princip. of Compar. Physiol., p. 268.

[2] Carpenter, op. citat., p. 270.

system generally, and in part to the lungs. The tadpole corresponds in the arrangement of its vascular system, with the piscine type.

Birds and *Mammals*, only, possess a complete double circulation: the heart containing four cavities, with a separation of the respiratory from the systemic chambers and vessels. It is quite unnecessary, in this essay, to dwell in detail upon the various methods of blood-movement in the different orders. It must be mentioned, however, that the *Human embryo* exhibits, in different stages of development, types of circulation successively on a parallel with those of the lower, and then the higher vertebrata; and, therefore, *for a certain time it is aortic.* "The heart," says Cruveilhier, "in its simplest condition, consists of a *straight tube*, which is placed vertically in the body."

As exceptional arrangements, let us glance at certain peculiar vessels in the *Cetacea*. The following is the familiar description of John Hunter:—[1]

"In animals of this tribe, there are many arteries apparently intended as *reservoirs*, where vascularity could not be the only object. Thus, we find that the intercostal arteries divide into a vast number of branches, which run in a serpentine course between the pleura, ribs, and their muscles. The medulla spinalis is surrounded with a network of arteries in the same manner," &c. &c. These vessels are evidently constructed in adaptation to the long continuance of the animal without access to the air. Dr. Allen Thomson[2] remarks upon the difficulty of understanding how the blood is sent from these vessels, when needed, into the general system; a difficulty which disappears when we consider those analogies, which lead us to apprehend that the contractility of all arteries is constantly and normally affected by the conditions of nervous influence, and of nutrition and functional action.

In terminating, for the present, our consideration of the analogies of the circulation, I wish to renew the emphasis which has been already laid upon the fact, that, in no instance, can we ascertain, in any species of animal, evidence of *active dilatation* being a normal occurrence in, or endowment of arteries. The very striking fact of the existence of special muscles attached to the exterior of the great vessels in *Myriapoda* and *Insecta*, gives us the cap-stone to this arch of analogy.

We may also note, as of very great importance in this inquiry,

[1] Phil. Trans. 1787, p. 415.

[2] Cyclop. of Anat. and Physiol., vol. i. p. 577.

the uniform occurrence of *pulsatile propulsion*, whenever a distinct system of vascular canals exists. This is but the extension, or the repetition, under different conditions of velocity and force, of the *peristaltic* or vermicular movement belonging to the alimentary canal, and to other tubes or cavities conveying the fluids of nutrition, secretion, or excretion. One law determines and pervades all of these: it is the *law of alternate contraction and relaxation, of all muscular fibres, pre-eminently observable in the smooth* or involuntary muscles of organic life. As further illustrative of this, Claude Bernard has found that the ductus choledochus and pancreatic duct have rhythmical movements. Dr. Brown-Séquard has lately shown that the same thing occurs in almost all the excretory ducts of glands, in birds; and, also, in the trachea and bronchiæ, in large sea-birds, with each expiration.[1]

Do not *veins*, therefore, pulsate, when they possess distinct muscular fibres? Yes; in proportion, generally, to the muscularity of the tissue. In them, also, we can consider the alternating movement as clearly proper to themselves, without the difficulty which exists in the case of arteries, of separating their own contractions from the effect of those of the heart. It may be remembered here that it is in the *larger* veins that muscularity is most abundant, as it is in the *smaller* arteries.

In some Invertebrata, and in Amphioxus, venous contraction has been long and often observed. But, in the essay of Dr. Allison, already alluded to,[2] mention is made of the discovery by Wallaeus, in 1660, of the pulsation of the venæ cavæ in dogs, after the excision of the heart; and of the observation by Steno, Lower, Whytt, Haller, Lancisi, and Senac, of pulsations of the same vessels in their natural condition. Lancisi saw the venæ cavæ in horses pulsate four or five times, while the auricles performed but one contraction. He hence deduces the natural conclusion, "ut non sit ambigendum quin *peristalticus motus* in ramis, ac ramusculis ipsius cavæ fiat a cuspidibus ad bases, seu a minoribus ramis ad majores et maximos truncos." Haller says of the middle coat of the vena cava,[3] "Musculosa est, *ut etiam pulset*, et conspicuâ contractione sanguinem in aurem dextram compellat." Broussais[4] argues from experiments on frogs, that the contractile action of the veins is one

[1] Med. Examiner, Sept., 1856; from Lond. Med. Times and Gazette.
[2] Am. Journ. of Med. Sci., Feb., 1839.
[3] Element. Physiol., tom. i. p. 124.
[4] Physiol. applied to Pathol., p. 366.

of the principal forces which cause the return of the blood to the heart. Müller observed the same phenomenon in the pulmonary veins and venæ cavæ of frogs. First of all, says he, the venæ cavæ contract, then the auricle, next the ventricle, and *lastly, the bulbus aortæ*. He also saw a contraction of the same veins in the cat and martin, apparently synchronous with that of the auricles.

Marshall Hall, Flourens, and others, have also observed pulsations of the great veins of frogs.

Allison's experiments[1] were made upon frogs, tortoises, and cats, chiefly; although, in fishes, in birds, and in the bullock, also, he observed pulsation of the venæ cavæ and pulmonary veins. In one experiment, the pulsation of the pulmonary veins of a frog continued five hours and a quarter after the heart had been cut out. In another, with a tortoise, motion was observable for eleven hours in the pulmonary veins, after excision of the heart. In the case of a cat, the venæ cavæ and pulmonary veins pulsated twenty-one hours after they had been *removed from the body*.

It was very evident, in all of these and other instances, reported by the same observer, that an impulse from the heart, either backward or through the capillaries, could not be the cause of the venous pulsation. This was frequently not synchronous with that of the auricle, even when connection with it was retained. T. Wharton Jones, it may be mentioned, has reported, in the Proceedings of the Royal Society,[2] his observation of a regular rhythmical movement of the veins of the Bat's wing, "obviously dependent upon their independent contractility."

I have to add another fact, of which I have not found any statement, or even any question, in physiological works. This is, that *the umbilical vein pulsates in the cord*. I assert it upon the faith of my own observations,[3] and of those of Drs. E. Wilson, and W. H. Freeman; relying most upon cases in which the cord is not contorted as it often is, but has the three vessels almost in parallelism; and noting particularly that Dr. Wilson has in one case observed

[1] Op. citat., p. 315.

[2] Feb. 5, 1852.

[3] It would be, perhaps, premature for me to assert, that *no* influence could be exerted, in the cases alluded to, in the compression of the vein by the contiguous arterial trunks; although, even supposing this to occur, the maintenance of such a power by the arteries, at a distance from the umbilicus, affords as great a confirmation of the truth of the view advocated, as could the active contractility of the vein itself.

he blood to flow in a *pulsatile jet* from the end of the vein near he body, divided from the cord by an ignorant person.

This pulsation of the umbilical vein, then, *cannot* be accounted or by the impulse of the fœtal heart, carried through the minute parenchyma of the placenta, and resisting the pressure of the air or of the amniotic fluid, to the length of a foot or more. Still less, of course, could this account for the pulsatile jet from the divided vein, near the umbilicus.

An instance is thus afforded, by this fact, of the observance of the *law* of alternate contraction and dilatation, in muscular tubes, spontaneous to themselves, however synchronous or continuous with those of other cavities. . .

Exceptional examples of the same kind of movement under morbid conditions, have been recorded as occurring in different veins, especially the jugular, of the human body. Morgagni, Gallen, Elliotson, Rush,[1] Johnson,[2] Davis,[3] and others, according to Dr. Allison, have reported such instances. The latter narrates his own observation of the pulsation of the subcutaneous veins of the neck in a lady, during attacks of violent headache, with which, alone, they seemed to have connection.

I have observed the same pulsation myself, in three different persons, and have no doubt of its not unfrequent occurrence. There was, in neither of my cases, any evidence of regurgitation from the heart to account for it.

One of these three patients had been occasionally affected with rheumatic irritation of the heart; but temporarily only, and with no proof of valvular disease; and the jugular pulsation was noticed in her at three different times, at intervals of two or three years, on two of which occasions at least, there were no heart symptoms whatever present.

In each instance alluded to, there was *local* irritation of the throat; in two, tonsillitis without abscess; in one, an abscess of the tonsil, whose rupture was followed by the immediate cessation of the jugular pulse. One of these patients was a laboring man about forty years of age, of excellent health ordinarily, and with no symptom whatever of heart disease. The third was a woman of twenty five, also of good health, excepting the acute attack of inflamed

[1] Philad. Journ. of Med. and Phys. Sci.
[2] Medico-Chirurgical Review, xxxii. p. 559.
[3] Dublin Hospital Reports, iv. p. 272.

throat. In each case the symptom mentioned *disappeared* with *local irritation.*

I cannot account for this phenomenon in any way but by an unnatural augmentation, under morbid stimulation, of the contractility residing in the muscular tissue of the vein.

We find in all of these examples, constant proof of the generality of the law of *alternate contraction*, established by Bowman as belonging to all muscles, and demonstrated by all authorities, to be especially prominent in those of organic life. The heart is well known to be intermediate, in its striated texture, and quick, although involuntary movement, between the two great classes of muscular organs. Must we not, on the wide basis of analogy now furnished believe that there is no sudden dividing line in this respect between the centre of circulation, in the higher animals, and the vessels which complete its current? May we not at least assert most positively, in regard to the *non-existence* of such a spontaneous alternating contraction in all arterial and venous trunks, *so far as they are muscular*, that "*affirmantibus incumbit probatio?*"

We may adduce as illustrative of, or, perhaps, rather illustrated by, this position, the two great laws which Dr. Carpenter enunciates as resulting from a careful survey of the vital functions as performed in the different classes of animals.[1] They are these:—

1. That throughout the whole animated creation, the functional character of the organs which all possess in common, remains the same, whilst the mode in which that character is manifested, varies with the general plan upon which the being is constructed.

2. That in cases where the different functions are highly specialized, the general structure retains, more or less, the *primitive community of function* which originally characterized it.

The effect of the application of these laws to the question, as to the degree of functional activity belonging to each part of the circulatory apparatus, in its most specialized forms, is *simply to increase* the burden of proof resting upon those who assert the loss of this "primitive community of function" in a part, by specialization; as the above laws make such a loss an *à priori* improbability.

We cannot have done, however, with the argument from analogy, without first endeavoring to set at rest the general inquiry, whether in any muscular tissue, or organ, under any influence, there is evidence of active, forcible *dilatation*, or elongation of muscular fibre.

[1] Princip. of Comp. Physiol., p. 156.

If found at all, we might suppose it would be, proba
heart itself. It has been asserted, or imagined there to e
quality of elasticity, in the heart and pericardium, would
power of suction to the diastole of the heart, comparable
less in degree) to what we see in the ordinary caoutch
and syringe, so that any evidence of a force exerted in th
the heart, must be very positive and considerable, to all
supposition of *muscular* dilatation to account for it. Bu
no such positive, unequivocal evidence. After Bichat, C
has made, upon the strength of a case in which the heart
born child was exposed, the most direct assertions upon
ject.[1] He declares that "the hand which firmly grasps th
forcibly opened by its diastole." The diastole of which l
is that of the *ventricles*, which is synchronous with the *syst*
auricles and venæ cavæ, and pulmonary veins.

It is, therefore, in the living heart, the force of this *aur*
tole, which is measured by the diastolic expansion of the v

Œsterreicher[2] and Clendinning[3] experimented upon the
excised hearts of different animals (the frog and the ass)
with a small weight, and the other with a pair of spring
and both failed to perceive proof of any diastolic force.
who rarely assents to any experiment without having tri
himself, expresses himself in this mode: "The auricles ac
their relaxation, the *yielding character* which is necessary
of the entrance of new quantities of blood."[4] This is all.

The os tincæ is, perhaps, more subject to observation t
other dilatable orifice, except the external sphincters. Bu
not find even Madame Boivin, while distinctly recognizing
scribing the muscular fibres of the os and cervix uteri, mo
allowing that these weaker fibres *yield* (under absence of s
to their own contraction) to the efforts of the extruding
the womb. The index of every obstetrician may bear witn
it is *only after*, or with, and never in anticipation of, such p
pressure by means of the fœtus and its bag of waters, tha
opens.

The cardiac and pyloric valves of the stomach, and the an
arrangements of the intestinal canal, are scarcely subject to

[1] Anatomy, p. 493.
[2] Lehre vom Kreislauf des Blutes, p. 33.
[3] Kirkes and Paget, Man. of Physiol., p. 86.
[4] Op. citat., p. 176.

than speculative inquiry. They are *sphincters;* and every thinker has the opportunity of reasoning upon the phenomena of this class of muscles from familiar facts. My own conclusion is—that none of them do more than simply *yield*, or avoid active contraction, while the stronger muscles act. Nervous connection (mysterious as yet in its details), no doubt determines this order of events.

The iris, whose alternate contraction and expansion serve so important a physiological purpose, is supplied with a special "dilator pupillæ;"[1] which, according to Kölliker, consists of "numerous slender fasciculi, which run inwards, and are inserted at the border of the sphincter."[2]

Why should we, but for the total absence of any physiological "self-repellent" (mutually repellent) force in muscular tissue, have always, where the effect of orbicular contraction is to be reversed, antagonistic contractile cords, or masses of muscle? *E. g.*, the levator supercilii; levator palpebræ; levator anguli oris; levator ani, &c. &c.

It is (I may without presumption venture to believe) due to our assurance of the certainty and accuracy of natural laws, in living organisms, as well as in sidereal cycles of movement, that physiologists should rest full emphasis upon such general facts.

It should be a maxim of cardinal positiveness and force, that any supposition which is *clearly proved* to be *unphysiological must be held to be untrue.*

Let there be substituted, upon the subject of this inquiry, a clear application of such a mode of reasoning, for the hesitating and almost contradictory expressions of various physiologists in regard to it. We shall have then to state, that wherever it has been possible fully to study muscular action, the best of authorities agree in finding *no instance of active dilatation*, or *dynamic elongation of muscular fibre.*[3]

Hence, to suppose such a phenomenon in the *vascular system*, which, more than almost any other, exhibits facts only under the greatest obscurity and difficulty of interpretation, is to suppose what is *unphysiological;* and therefore must be considered untenable or untrue.

[1] Brücke and Kölliker, *Vide* Microsc. Anat. of the latter, p. 736.

[2] The tonicity or habitual contraction of this muscle tends to retain the pupil in a dilated state. (Parry.)

[3] *Vide* Hunter's works, vol. iii. p. 150.

III. ACCIDENTAL AND PATHOLOGICAL DEVIA

We may, for convenience, consider under this head not strictly accidental (being normal and physiolo phenomena of the erectile tissues; as well as those temporary and occasional alterations of vascularity i parts, occurring under local causes. *Telangiectasis*, or manent dilatation of the vessels of a part, affords a cal illustration of the same subject. More striking d however, are observed in acephalous and acardiac mons *Inflammation* also presents a field, not yet conquered, alt often explored, more important perhaps than any other up this inquiry will lead us. The full consideration of its however, will be most appropriate and easy, after some a those experiments which have a certain relation to its exp

Erectile Tissues and Organs.

The portions of the human body which exhibit this pe most evidently, are the corpora cavernosa of the penis and the nymphæ, and the nipples. The spleen is supposed a somewhat erectile, and so is the uvea of the eye, &c.

In each of these organs, but particularly in the cavernous the erectile tissue is described as consisting essentially of a of veins with varicose enlargements, inclosed in a fibrous with trabecular partitions." Magendie considered the ca structure as not venous, but intermediate between the arter venous terminations, being directly connected with and supp the former.[2]

What is the cause, or *modus* of erection in the penis, con as a type of the erectile organs?

The theories are three:—

1. That which supposes the ischio-cavernosi muscles to co the veins against the crura, producing congestion of the structure of the penis by this simple obstruction.[3]

[1] The subject of aneurism, and that of the other altogether morbid str affections of the arteries, do not appear to the writer to be appropriate essay; the purpose of which is to embrace especially the *functional* relation arteries.

[2] Lectures in the Lancet, 1834-5.

[3] Haller, Element. Physiol., tom. v. p. 590.

2. That of Kölliker, that erection consists[1] in the "relaxation of the muscular elements in the *trabeculæ* of the cavernous and spongy bodies, and of the *tunica media* of the arteries of those parts; in consequence of which, the tissue, like a sponge which has been compressed, expands and becomes filled with blood; rigidity ceasing when the muscles again contract."

3. That which accounts for erection by the *active injection* of blood (Prochaska) into the part, by the vessels (aided perhaps by the subsequent compression of the veins by the ischio-cavernous muscles); this theory being founded chiefly at present upon the observation by Müller, of the arteriæ helicinæ.

These vessels are described by him[2] as given off nearly at right angles from both the larger and smaller arteries of the penis; being about $\frac{1}{100}$th of an inch in diameter, and $\frac{1}{12}$th long; contorted and connected directly with the venous caverns, without capillary intervention. Kölliker, also, gives a very full account of them from his own observation.[3]

The authority of Valentin has been, with that of Berres, asserted to stand against the existence of these special erectile arteries; but Valentin does *not* deny their existence,[4] but only the fact of their terminating in blind extremities, as Müller at first supposed they did. On the contrary, he, Valentin, describes very fully their presence; alluding also to the fact, that in the dead subject the erection may be imitated, by the injection of fluid actively distending the venous meshes. He suggests, also, that the escape of blood by the veins (the arteries being unobstructed from their central site) may be opposed by the contraction of part of the *unstriped fibre* which occupy the septa.

The contraction of the ischio-cavernous muscles being reasonably considered to be adjuvant, only, to the complete erection, the main question would seem to lie between the active relaxation of the organic muscular fibres of the trabeculæ, on the one hand, and the active injection responding to a local or other stimulus, increasing the *flow* through the arteries into the part, with some contraction of the trabecular fibres in a manner to obstruct the escape of the blood through the veins.

[1] Microscop. Anat., p. 637.

[2] Müller's Archiv. fur Anat. und Physiol., 1835; Trans. in Edin. Med. and Surg. Journ., July, 1835.

[3] Microsc. Anat., p. 633.

[4] Text-book, p. 629.

We have upon this question but two further obse
make, and will then leave the subject with the reader.

Firstly. The erection commences at the *root* of the org
this fact upon the authority of Valentin, in regard to t
subject (*op. citat.*, p. 629), although any one may observe
horse. If distension were caused by primary *expans*
venous cavities (being dependent, evidently, whatever t
upon nervous excitation), it would begin at the most sen
the glans, and proceed toward the crura; while *arterial*
hibits itself, of course, in an order indicating the origin an
of the vessels, first at their root, and afterward toward
nation.

Secondly. I would appeal again to that overruling for
logy which has been cited; and, not content with the exp
Carpenter,[1] that "it is *rather difficult* to admit the power
to cause relaxation of muscles, which this hypothesis re
would assert, that where direct stimulation is a part at lea
causation, it is impossible.

It may be added, that Müller has also shown the nervo
of the corpora cavernosa and helicine arteries to be from t
gastric plexus of the sympathetic; a fact which will ha
interest in connection with a future part of this inquiry.

In erectile tissues which contain no cavernous trabeculæ
the nipple, the above reasoning becomes still more forcibl
priate. Here we *must* consider, I think, that, in the words
chaska,[2] "a greater flow of fluid into the vessels produces t
phenomenon."

Of increased vascularity in a part under temporary a
causation, we find examples in the effect of blows or fricti
the surface, and of sinapisms or other rubefacient applicat
blushing, and, still more interestingly, in the physiologica
mination of blood to organs in particular states of develop
functional change; as, *e. g.* to the maxillæ in dentition,
ovaries and uterus in ovulation, menstruation, and pregnan
to the mammæ in lactation.

The tendency of modern physiology has been to enla

[1] Princip. of Hum. Physiol., p. 502. Note.—Dr. Carpenter objects als
hypothesis of Kölliker, the fact that moderate cold (as that of a clean sh
often cause the erection even of the male nipple.

[2] Functions of the Nerves, Syden. Soc. ed., p. 416.

[3] In the pregnant uterus, the arteries actually *increase*, not only in diam
in length and weight.

estimate of the part which those changes constituting nutrition, in the capillary region, take in the circulation of the blood. It is even assumed by Dr. Draper,[1] in treating of the "vis a fronte" in animals, that "the oxygenizing action of the arterial blood is the true cause of the systemic circulation;" the heart only serving to *time* the relative proportion of movement in the systemic and pulmonic vessels.

The falsity of this as an exclusive dogma, has been proved by so many experiments, as to need no citation here; although it is true that a very important principle is maintained in the recognition of this "vital affinity," as *one* of the moving powers of the circulation, and as particularly important in the distribution of the blood according to the needs of every part.

It may very probably be true, that in the simplest animals, as the protozoa, radiata, and lower mollusca, there may be no other determining cause for the slight variations which occur, than such as exist in plants, aided by the general animal contractility. But, when specialization begins, we find it at first shown in the creation of additional contractile vessels, which, as they differ in magnitude, number, and force, must vary the supply of fluid which they afford. And, when this specialization approaches its highest point, the irritability of vascular trunks is no longer entirely controlled by their direct stimuli, but is confided to some extent to a nervous apparatus; as is the case with all the muscles, of the organic hardly less than of the voluntary system.

It is this principle which is so beautifully illustrated in those vascular changes which are of a more sudden character; while it is undoubtedly of equal importance, although more recondite in its exhibition, in all that concerns the varying distribution of blood (of the higher animals at least), for whatever purpose and in whatever manner.

What change in the nutrition of a part can accompany blushing? Or the blow of a switch; or friction, *even with ice;* or the application of a mustard plaster, or of ammonia, for a few moments? Hunter[2] found that, in the case of a patient, to the ball of whose toe

[1] On the Chemistry of Plants, p. 36. The idea of the *vis a fronte* of nutrition, although *developed* by Prof. Draper, had been suggested by Dr. Black (Essay on the Capillary Circulation, London, 1825), and Alison (Outlines of Physiology, Supplement to 2d edition, Edin., 1826). *Haller* considered that such a force *must* exist, "de toute nécessité." For a suggested modification of Dr. Draper's theory, see a notice of his "Human Physiology," in Philadelphia Medical Examiner, Oct., 1856.

[2] Works, vol. iii. p. 201.

caustic was applied, a fulness of all the vessels, *including veins*, of the limb, followed; and this occurred repeated whatever power the vital affinity or "vis a fronte" ma maintaining a current *in* the capillaries, it certainly cann under the action of such a stimulus, to propel so great a far *beyond them*, into the venous trunks.

Unzer states that local determination of blood follow upon the surface of the body of an animal even after decapitation.[1]

Valentin asserts a similar fact in regard to the ejaculatio Are not these two facts kindred, belonging, *both*, evident category of *reflex actions?* Unzer evidently considers t the case in regard to the first, classing the rush of blood which is struck, among the "direct nerve-actions of exte pressions."

We find, again, a similar parallel to blushing, as a (not reflex) hyperæmia, in those emissions which take pl *ideas* during sleep. There is as much evidence of nervous tion in the one case as in the other. After having embr opinions which, as the result of impartial inquiry, it is object of this essay to expound, I discovered, with delight, recognition of them in the profound treatise of Unzer; which contains, not only the germ, but almost the mature those discoveries whose development has since made the reputation of Marshall Hall.

And yet there is a degree of vagueness, resulting nec from the then imperfect knowledge of the vascular system expressions in regard to the minute anatomy of congestion vagueness which hardly any writer upon the subject has es

In physiological determinations of blood to particular org have no reason to doubt the presence of a similar *reflex* The primal cause of such movements may probably be in sues themselves, and in their modified "vital affinity" plasma of the blood; but that this is not all, and that the n influence is involved, by its control over the arterial circul careful comparative induction will lead us to believe.

Already, the ganglionic or sympathetic system has been fo

[1] Princip. of Physiol., Syd. Soc. ed., p. 246.
[2] Text-Book, p. 625.
[3] Published at Halle (or Leipzig), in 1771.

present instances of reflex action even in disease, by Dr. H. F. Campbell, of Georgia,[1] and somewhat later, by Bernard;[2] although Longet, in his admirable *Traité de Physiologie*,[3] published in 1850, evinces a distinct recognition of the general fact of reflex action occurring as an attribute of the sympathetic. Prochaska,[4] Grainger,[5] and Clark,[6] are also quoted as having recorded the same opinion.

The mode in which the influence of the splanchnic ganglia is exerted upon secreting organs would appear to be twofold: 1. By control of their arterial supply; and 2. By an influence of a more obscure, but scarcely less certain nature, which we may (according to the idea, although not in the language, of Golding Bird[7]) designate as *neuro-chemical;* the analogue of the electrolytic force.

In regard to the first of these, it is enough to quote here the dicta of two able writers upon the sympathetic.

Cruveilhier remarks,[8] that "we *cannot pay too much attention* to the connection between the ganglionic nerves and the arteries."

In the *Medico-Chirurgical Review*, 1845, quoted by Dr. Campbell,[9] is given the opinion, by Dr. Proctor, that "it is to the sympathetic (and to that alone) that we must look as the *regulator of the arterial system.*"

Petit, Winslow, and Bichat, believed the ganglia to constitute a *totally distinct* and independent system of organic centres and nerves. Dr. Davy, of London,[10] advocates a very similar opinion.[11] It would be inferred from his reasoning, and, in the opinion of the writer, may be very well borne out by comparative physiology, that the nervous systems of the radiata, mollusca, and all but the highest articulata, are the analogues *less of the cerebro-spinal* than of the *ganglionic* system of the vertebrata, including with this the

[1] Southern Med. Journ., June, 1850; also, On Typhoid Fevers, in Trans. Am. Med. Assoc., vol. vi. p. 463.

[2] Gazette Médicale.

[3] Tom. ii. p. 379.

[4] 1784. [5] 1837. [6] 1836.

[7] On Electricity and Galvanism, p. 78.

[8] Anatomy, p. 845, Am. ed.

[9] On Typhoid Fevers.

[10] Lancet, June, 1851.

[11] The experiments of Cruveilhier, Valentin, Longet, &c., nevertheless, show a close connection, and even dependence, of the sympathetic upon the cerebro-spinal axis: corresponding with the mutual interdependence existing between *all* important organs in animals of a high grade.

medulla oblongata; which last may, no doubt, be consid
intermediate between the ganglionic and spinal systems
taking to some extent in the attributes of both; while it
more directly than either, with the brain, as the organ o
and of the will.

Undoubtedly, however, everything anatomical and phy
points to the functional connection of the ganglia and
the sympathetic system with the viscera and with the circ

Its power over the latter is a fact in physiology, w
wanted but one link to make it unite harmoniously w
known laws of the system, in explaining many vital phen

This link is the knowledge of the mode in which arteries a
by nervous control, so as to regulate the varying supply of
different parts: a point which has remained singularly o
kinds of hypotheses, in spite of the labor bestowed upon i

It is the object of this essay to ascertain how far it is po
a simple and rational induction, to remove this deficiency.

In regard to *telangiectasis*, there is perhaps more inte
direct profit to be gained by its study in connection with
quiry. It is questionable, with regard to the vascular
whether their origination be capillary or arterial. There
be, however, a state of insusceptibility, a want of contra
the arteries. "Always," says Breschet,[1] "their parietes w
soft, flaccid, and more like the parietes of veins than of
arteries." Dupuytren, in comparing them with erectile t
normal character, states that "their supply of nervous infl
small." Dr. Watson observes,[2] that there is no instance of
tation having progressed from the larger to the smaller ves
on the contrary, the diseased condition, commencing in the
ries, may extend to all the vessels of a limb, or even the
vessels of the body.[3] The vitality of such tumors is low; t
with difficulty be made to inflame, and, when they do, are
mortification.

This contrast to the healthy erectile tissues is importan
latter are remarkable for their nervous susceptibility, and
supply of muscularity in their vessels.

The treatment which Abernethy pursued with unquest

[1] Mém. de l'Acad. Royale de Médecine, tom. iii. p. 177.

[2] On Telangiectasis, Am. Journ. Med. Sci., May, 1839.

[3] Some later investigations have been made, by Virchow and other furnish nothing new, however, for our present object.

success,[1] by continued cold combined with pressure,[2] confirms the idea that deficient muscularity and contractile power, in the arteries, are a part of their pathology. Cold is known to produce, when thus applied, a *tonic* contraction of muscular tissue, along with a diminution in the volume of the fluids of the part, which allows the elasticity of the capillaries to diminish their bulk.

In this *increased vascularity from passive dilatation of the vessels*, we have *one* of the conditions of what is ordinarily called "chronic inflammation." But in the latter state, there may often be an increased irritability or *hyperæsthesia* also. The term "chronic inflammation" is one whose hold upon pathology is becoming unsettled; as it has been made to cover the ground of various states, some of which have very little resemblance to inflammation. More of this hereafter.

Let us proceed to consider briefly the bearing which the history of *acardiac monstrosities* appears to have upon our subject.

Not having been able to see the full memoir of Béclard, I have referred especially to an article by Chaussier and Adelon, in the *Dictionnaire des Sciences Médicales*, in which his views have been embodied; and to the work of St. Hilaire, upon *Anomalies;* as well as to several cases upon record in different journals.

It will suffice for our present purpose to take for illustration three examples, from quite different sources.

1. Dr. J. B. S. Jackson, in the *Am. Journ. of Med. Sciences*, for 1837 (p. 362), reports the case of a fœtus, which lived until birth at term, in which the brain, heart, lungs, stomach, liver, spleen, pancreas, and right kidney, were wanting. A diagram is given, in which the umbilical vein and ascending vena cava, with their branches, are seen to run nearly parallel to the aorta. The single umbilical artery of the cord is fed by two branches, which proceed from rather lower down than usual. Sufficient evidence was given that the placenta was separate from that of the twin fœtus born with it. Hence, as Dr. J. remarks, "the circulation of the blood must have been carried on *by the vessels alone.*"

The explanation alluded to as that which would have been considered the most probable in case of a fusion of the two placentæ into one mass, namely: that the blood might then be forced by the heart of the normal child into the *umbilical artery* of the monster, reversing

[1] Watson, loc. citat.

[2] Pressure without cold, is stated by the same authority to have been *much less* successful.

the usual current—appears to me, under all circumstances, almost or quite untenable. Teratology, like other pathology, can be only an "erring physiology;" altering, but never reversing natural laws. The doctrine of final causes cannot be brought into play against this view; as we can conceive of no design, in the creation of monsters, of sufficient moment to induce such reversal. The veins, in Dr. Jackson's case, were not examined, to see whether or not they possessed valves.

2. A case described by Dr. Houston, in the *Dublin Medical Journal*, 1837, is made the subject of some remarks, by Dr. Carpenter,[1] to which I shall allude. Dr. C. observes that, in this case, some cause present in the imperfect fœtus must, in the absence of a heart, have been sufficient for the propulsion of blood through its vessels.

This cause he believes to have been the "capillary power;" asserting that "the usual functions of the arteries and veins must have been reversed; as the vena cava, receiving its blood from the umbilical vein nearly as usual, had no communication with the arterial system (the heart being absent), except through the systemic capillaries; to which, therefore, the blood must have next proceeded, returning to the placenta by the umbilical artery. The veins were everywhere destitute of valves."

In view of the extreme improbability of this rationale of the circulation, "reversing," to such a degree, "the usual order," we cannot help wishing that the accomplished observer had once more searched for the rudiment, at least, of a "ductus arteriosus," which might convey blood from the vena cava to the aorta; thence to be distributed, and finally returned as usual by the umbilical artery. It is impossible, however, I must confess, not to yield to the combined testimony of Sir B. Brodie (*Phil. Trans.*, 1809) and Houston upon this point; but so strongly am I convinced of the improbability of a complete reversal of the direction of the current of the blood, that I would even prefer to found—upon the facts of Dr. Houston's case, and of those of Sir A. Cooper, Tiedemann, Brodie, and Breschet—a *new hypothesis* of the normal fœtal circulation, questioning the accuracy of the observations upon which the accepted theory is based.[2]

[1] Princip. of Hum. Physiol., p. 493.

[2] However crude such a supposition may appear to be, it is not without some considerations to support it: as—

1. The *angle* at which the umbilical arteries meet the iliac.

This hypothesis, if indulged in as an alternative, would be as follows: That the umbilical *arteries*, not the veins, are the carriers of blood *from the placenta*, distributing it through the fœtal arteries which arise from them; not returning the blood to the heart. Then the blood would be returned by the systemic veins of the fœtus to the vena cava, a considerable portion, however, going by the ductus venosus to the umbilical vein, and thus *back to the placenta;* while the rest of the venous blood passes on to the heart, and is thence distributed through all the vessels in their normal direction.

This hypothesis would, if it could be acknowledged, reconcile the facts in the circulation of these monsters with those of the perfect child, upon the supposition that, *without reversal*, the umbilical arteries conveyed their placental blood to them; while it would also explain the import of the observation of Sir A. Cooper, of the anastomosis of the arteries of the two cords—the two placentæ being fused into one; as in this case we have only to suppose that through these anastomosing arteries, the larger division of the double placenta lent blood to the vessels of the smaller—the currents in the two being parallel. I throw out this hypothesis, however, without close scrutiny, and merely as an *alternative.*

In any case, we can but remark upon the hypothesis adopted by Dr. Carpenter, that it would seem to claim *too much* for the capillary power. On the supposition of no other force being engaged in the case described, the capillaries, or the capillary power, would have to draw the blood in the first place from the placenta through the funis (*à fronte*), and then to urge it onward through the aorta (*à tergo*), even to the placenta again, by the umbilical artery. How much more rational it would seem to acknowledge, also, the presence here of a power not idle in any animal of high organization, viz: the

2. The fact that Chaussier and Béclard could not cause a mercurial injection to pass into the uterine veins by the umbilical arteries, but *could* inject them by the umbilical vein. (Adelon, *Physiol.*, tom. iv. p. 482; and Burdach, *Physiol.*, tom. iii. p. 561.)

3. The difficulty of accounting for the transfer of blood from the placenta to the fœtus, is about alike according to either view; the same powers being engaged. Upon the hypothesis named, the flow through the umbilical arteries would be comparable to the lymphatic circulation; and so would be that in the vein, supposing (as the observation of Chaussier and Béclard would suggest) that direct communication exists between its terminations and the uterine veins, as well as between the umbilical venules and arterioles in the placenta; as described by Wrisberg and Lobstein. The author is not, however, ready definitively to adopt the paradoxical supposition named in the text. It is a question altogether incidental, and not essential to our proper subject.

contractile propulsion of the arteries and larger veins! That this is not, at least, an improbable suggestion, will appear still further from the next case.

3. In the *Bulletin de la Soc. d'Emulation*, 1821,[1] occurs a record by the distinguished Serres, of an acephalous monstrosity, in which "à la place du cœur, existait un organe de forme à peu près cylindrique," "*comparable au vaisseau dorsal des insectes.*" Such an organ could hardly exist without performing the function of a contractile vessel; and it furnishes precisely the proof which was wanted of the probability that a similar function is performed by the arteries in every acardiac fœtus; especially as we know that, at a certain stage of embryonic life, *every* child is acardiac, and has an arterial circulation somewhat like the crustacean's. It may be well to allude, retrospectively, to the fact, that the argument sometimes used of the arterial phenomena in crustacea and other articulata being obscurely commingled with those of the capillaries, is answered by a reference to the observation (Siebold) that, in many of these animals, *no* distinct capillaries at all exist; the minute circulation being lacunar.

It is stated by Chaussier and Adelon, and by St. Hilaire, that the acephalous fœtus has never either heart or lungs. The lungs and heart are always present or absent together. In lower organizations, I believe, no animal has a heart which is without something like a respiratory apparatus, either branchial or pulmonary. This much would seem to favor Prof. Draper's opinion, as to the heart being essentially a sort of balance-wheel between the systemic and respiratory circulations.

What, then, is the theory which naturally suggests itself with regard to these monsters? That, according to the law true in all cases of monstrosity, of the non-development of a part whose nerve-centre is absent, the medulla oblongata being deficient, the lungs are not formed; and that, by a further law of coincidence, if not of causation, absence of the lungs is attended by non-formation of the heart. The circulation then retains the type which belongs to its earlier stages; being carried on by the contraction of the vessels, aided by capillary power. In connection with the history of these monstrosities, reference may be made, in brief, also, to the continuance of the circulation without dependence upon the heart, displayed in cases in which, by ossification or the presence of tumors, that

[1] Sept., p. 339. See, also, St. Hilaire, des Anomalies, tom. ii. p. 475.

organ has been entirely deprived of the power of propulsion; as in instances recorded by Sir C. Bell and by Allan Burns.[1]

The subject of inflammation may be to the best advantage disposed of at a later stage of our inquiry.

I may mention, however, at present, as facts having an interest hereafter to be referred to, that Storer, Wilson Philip, and many others, have noticed the diminution of the pulse in paralytic limbs;[2] that, after mortification has taken place, although the vessels remain pervious—as proved by injection after amputation—no pulsatile current takes place through them;[3] that large arteries, exposed after crushing of the limbs by railroad accidents or gunshot wounds, do not bleed[4] until recovery from the shock has occurred; and, also, that Warren, in his *Surgical Treatise on Tumors*, mentions a case of aneurism of the right eye in which throbbing of *both* carotids occurred (of the left, apparently, from sympathy), and was arrested in both by ligation of that upon the side of the aneurism. The observations of Lawrence and others upon the flow of blood from opened vessels of an inflamed limb, will be alluded to hereafter.

A case of *reduplication of both sounds of the heart* has lately[5] been reported by Dr. Austin Flint, in which the *pulse was not synchronous* with the beats of the heart; the latter being 160, while the former was but 80 per minute. Cannot this be explained, much most readily, upon the supposition that the arterial system has a *regulating power of its own*, as to the rate of its movements, in its *muscularity* as well as elasticity? There is also some interest in the fact that, in the person of a gentleman named Whitaker, now (1856) attending lectures in Philadelphia, the radial and ulnar arteries of the same arm vary frequently and considerably in their proportionate force and fulness of pulsation; even within a few minutes, a perceptible difference and alternation being sometimes observed. *This* phenomenon *must* be arterial; having nothing whatever to do with the cardiac impulse.[6]

[1] *Vide* Bell on the Circulation of the blood, p. 33.

[2] Dr. Holland, in his Medical Notes and Reflections (p. 534), relates a case of cerebral hemiplegia in which a marked difference existed in the pulsations of the two carotids.

[3] Houston, Dublin Medical Journal, loc. citat.

[4] Guthrie. See, also, Med. Times and Gazette, Nov. 18, 1854. An Army Surgeon of the East there reports, that "there was no instance of any immediate serious bleeding from any of the wounds at Alma."

[5] Western Journal of Medicine and Surgery, April, 1855.

[6] Schiff and Callenfells have recently observed curious periodic contractions and

IV. EXPERIMENTAL INQUIRY.

In entering upon this department of our discussion, roper to reassert the opinion, that the due relative place nent is, in physiology, *supplemental* to observation, and s o analogy.

The reason for this view, in one word, is the difficulty ending rightly all the circumstances, and interpreting t of experimentation. In mechanics, an experiment may t direct, and conclusive; in physiology, it is a complex phe and this complexity increases in direct ratio with the con of an organism, and our comparative ignorance of its func

Many experiments, therefore, are merely negative in t dence; and none should be allowed an irrefragable pos until they have acquired cumulative weight, and have be with even more scrutiny than is given to mere facts of observation.

A neglect of this principle has often retarded the pro physiology. Hunter's erroneous dogma of the non-absor fluids by the veins;[1] and the agitation of more dangerous which followed the announcement, by Crosse and Weeke electric birth of an acarus, and that of the artificial form urea by Wöhler—are instances of, at least, temporary ha by wrong interpretation of experimental facts.

Upon the subject of the present inquiry, no doubt exis mind of the writer that a similar aberration has been pro the same mode.

Experiments have been made by men whose *facts* are m certainty; and whose explanations are entitled to the hig sideration, but yet are open to question. The direct res experiment, and the inference to be drawn from it, are t different things. It is scarcely necessary to fortify this op a reference to the high authority of Sir Charles Bell;[2]

dilatations of the arteries of the ear of rabbits; accompanied by a con change of temperature.—*Brit. and For. Medico-Chirurg. Rev.*, July, 185

[1] Corrected finally by other experiments, particularly those of Mayo a

[2] Essay on the circulation, p. 26. *Le Gallois* applied to physiologi ments, the words of Seneca in regard to charities: "*Perdenda sunt mul ponas bené.*" Even the materialistic Comte expresses himself in this m periment cannot but be less and less decisive, in proportion to the co

only say, with a more recent author, that *physical laws are inexorable; and however intractable a new fact may seem to be, the bond will always, at least, be found, which confirms its subjection to general truth.*

With this view, we may consider briefly those experiments which most particularly bear upon our subject.

The purpose of this essay, however, is not historical, but argumentative. I have no object in bringing together other than a selection of such experiments as lean most strongly either to the one or the other side, upon the question of the function of arteries. To recount, therefore, all that has been done to prove the true contractility of these vessels by very numerous observers,[1] would be quite unnecessary.

It is enough to select a very few of these for inspection of their particular facts. We must add to them, also, some consideration of the chief bearing of certain other observations; as those of Hales, Poiseuille, Volkmann, Ludwig, and Bernard, upon the pressure of blood in the arteries, and those of Budge, Weber, Moritz, Schiff, and several others, upon the effects of division and irritation of the pneumogastric, the trigeminus, and the sympathetic nerves. The particular bearing of each of these upon our subject, is all that we need to consider.

With regard to the contractility of arteries under the application of artificial stimuli, the most characteristic results are those detailed by Verschuir (1766),[2] E. and E. H. Weber (1846–7),[3] and T. Wharton Jones (1850).[4]

By Verschuir, the stimulants used were "scraping with a scalpel; oil of vitriol, spirit of ammonia, &c." Although the arteries responded to these acrid stimulants in one or more places, in another part of the same animal this did not occur. Further, the contractions continued for some time before the artery was restored to its former condition; consequently the contraction and relaxa-

the phenomena to be explored; and, therefore, the nature of the phenomena seems to offer almost insurmountable impediments to any extensive and prolific application of such a procedure in biology." "It is no wonder, if physiological experiments have, with a few happy exceptions, *raised greater scientific difficulties than those proposed to be solved.*"—*Positive Philosophy*, trans. by H. Martineau, p. 310.

[1] Haller, Winterl, Verschuir, Spallanzani, Zimmermann, Lorry, Soemmering, Hunter, Hastings, Parry, Dennisson, Vandenbosch, Schwann, Kaltenbrunner, Wedemeyer, Bikker, Thomson, Rossi, Guens, Aldini, Weber, Longet, Valentin, Wharton Jones, &c.

[2] Prochaska on the Functions of the Nerves, p. 411.

[3] Wagner's Handwörterbuch, 1846, and Müller's Archiv., 1847.

[4] Guy's Hospital Reports, 1851.

tion of the artery did not follow each other so quickly as the systole and diastole of the artery in its natural condition. It also appears from the same experiments, that a portion of an artery, which an acrid poison had caused to contract, was hard and rigid, and no longer pulsated; while at the same time, other portions of the same artery, untouched by the acrid stimulus, continued to repeat their pulsations.

The Professors Weber have given us the most complete examination of the effects of electrical currents upon arteries; which, they say, are best obtained by the magneto-galvanic apparatus. When the minute arteries of the mesentery of frogs, between 1-7th and 1-17th of a Paris line in diameter, were thus stimulated, they did not immediately respond to the irritation, but began to contract after a few seconds, so that their diameter, in from five to ten seconds, was diminished by a third, and their sectional area consequently diminished to about half; by a continued application of the stimulus their calibre was so much reduced that only a single row of corpuscles could pass; and at last the vessels became completely closed, and the current arrested, the original condition being gradually restored on the cessation of the electric current.

Wharton Jones' experiments were made upon the web of the frog; with sulphate of atropia, cold water, mechanic and galvanic irritation, &c. &c. We will allow him to describe them for himself.

"Under the operation of various influences on the web, the arteries become constricted or dilated, usually first constricted and afterwards dilated. The constriction and dilatation, however, take place with different degrees of rapidity, and to different degrees of extent, according to the nature of the influence, thus:—

"1. Constriction may slowly take place, and be slowly succeeded by normal width. This I have found to be the effect of the action of sulphate of atropia.

"2. Constriction may quickly take place, and be soon succeeded by the normal width, or a width not much exceeding the normal. This has been found to be the effect of the moderate application of cold, mechanical irritation, and galvanic irritation.

"3. Constriction either does not take place at all, or, when it does, it very rapidly gives place to great dilatation." This is the effect of solution of sulphate of copper (gr. xvj to ℥j) with wine of opium (℥j), of a strong solution of common salt, of Battley's liquor opii sedativus, and of a drop of spirit of wine. The last three produce immediate constriction, quickly followed by dilatation.

"4. Dilatation, preceded or not by momentary constriction, which remains permanent. This is the effect of sulphate of copper in a concentrated solution. When a point of bluestone is rubbed on the web, in the neighborhood of, or over an artery, the vessel slowly but steadily becomes constricted, and remains so."

We may add, as closely correlative with the above, the reported effects of section of the nerves, upon the condition of the vessels.

1. *Section of the ischiatic nerve.*—After this section, the arteries of the web generally do not lose their contractility. They, nevertheless appear to become more dilated than usual.

2. *Section of a nerve accompanying an artery.*—It is very difficult to cut a nerve accompanying an artery of the web without injuring the artery. On the nerve being cut, constriction of the artery took place but soon ceased. The supervening dilatation was not so great above as below the injury. Opposite the injury, the artery continued somewhat constricted.

3. *Section of both the nerve and the artery which it accompanies.*—After the usual dilatation has supervened on the constriction which is the immediate effect of the section, it is found that irritation of the web over the artery still causes constriction of it, and that both above and below the wound.

Now, what do we have proved by these various experiments?

Firstly, by Verschuir's, it is shown that acrid and violent stimuli cause a gradual constriction in the arteries of a living animal, varying and uncertain in degree, and not at all resembling the pulse.

Secondly, by the Webers', that a similarly slow contraction follows the application of the galvanic stimulus, yielding to slow dilatation, if the current is withdrawn, but becoming permanent if it is continued.

Let us illustrate these appearances by other observations and facts, from different sources. "It is generally impossible," observes Valentin,[1] "to excite the vessels, smaller gland-ducts, spleen, &c., to contraction by mechanical or electrical excitation. The electro-magnetic machine is oftener, though not always, effectual. We then obtain, not vermicular movements, but tonic constrictions. These results are no doubt *determined by peculiar collateral* circumstances." It may be remarked, that the *gland-ducts* are included in the same effect, although vermicular movement has been usually, and reasonably, supposed to be normal to them. In the œsophagus, peristaltic movement is a matter of constant observation. And yet it is said by the same authority,[2] that when the shocks of the electro-magnetic apparatus are transmitted through the cervical trunks

[1] Text-Book, p. 387.

[2] Op. citat., p. 384.

of a dog or rabbit whose spinal cord has been broken up, *the whole œsophagus is thrown into a state of tonic spasm, and becomes shorter and thicker.* Again, the *heart*, according to Volkmann,[1] when removed from the body, and left entire, may be, by electrical irritation, thrown into a *state of fixed contraction, which lasts after the* cessation of the current. Does this show that the action of the *heart*, normally and during life, is not a quick alternation of contraction and relaxation? No. *Then why should a similar experiment prove any similar conclusion in regard to the arteries?*

Once more: Longet gives us[2] an instructive illustration of the effect of "collateral circumstances" upon such experimentation. Having many times galvanized without success the great splanchnic nerves in dogs, while in other cases quite forcible movements of the intestines were produced, "chose remarquable!" he observes, "ce dernier résultat a été obtenu quand l'intestin *renfermait des matières* alimentaires: celui-ci était-il vide, le plus souvent la stimulation électrique demeurait sans effet." A similar difference occurred to him with regard to the effects produced upon the stomach through the influence of the eighth pair.

A *combination of circumstances*, then, is evidently necessary to produce the contraction of involuntary muscles. Let it not be asserted, until we have with certainty imitated all of the essential circumstances of *arterial* action, that we have obtained a solution, by artificial means, of the mode of contraction and expansion of which this action normally consists.

Galvanism is not the *nerve*-force: however correlated (as are magnetism and electricity), they are not identical. Were they identical in nature, the mode of application, and degree of intensity and quantity, must still make wide differences in effect. In the dead animal the absence of arterial blood is very important.[3] In the living one, if the nervous connections are entire, we add at least an *excess* of excitation by galvanization of a vessel; if the nervous supply be cut off, we know not what mode of application of the current will substitute, and what will even reverse the effect of nerve-force. The different results of various degrees of the same influence are so obviously seen in many portions of the human

[1] Müller's Archiv., 1844, No. 5, p. 401.

[2] Traité de Physiologie, t. ii. p. 375.

[3] Haes and Wedemeyer proved, experimentally, that other fluids, when injected into the arteries, will not pass with the same rapidity as the blood. (*Lib. of Pract. Med.*)

economy, as hardly to need illustration. Thus, irritability of the stomach may follow a lesser, and insensibilityof it a greater degree of pressure upon the brain. Portal found that a slight pressure on the spinal marrow produced convulsions; a greater caused paralysis.[1] Bichat observed the same thing.[2] H. Earle noticed that the upper part of a palsied limb possessed the natural degree of sensibility; a lower part was morbidly sensitive; while the extremity was insensible.[3]

What are we to infer, then, from the above partial results, obtained with difficulty and uncertainty, by violent and disturbing agencies, upon the arteries? Nothing, clearly, in a physiological sense. They are *morbid, abnormal*, PATHOLOGICAL, only.

Looking at those narrated by Wharton Jones in particular, we may observe that the care with which they were pursued only tends to weaken their force in favor of the theory we combat.

Constriction followed by dilatation followed the application of most stimuli.

Constriction occurring quickly, and soon succeeded by the normal width, or a width not much exceeding the normal, was caused by moderate cold, mechanical, and galvanic irritation.

Permanent constriction followed the use of powerful irritants, such as the application of solid bluestone, or the same substance in concentrated solution.

Those stimulants, then, which least deviated from the normal degree of vital excitation, caused the most similar movement to that which we suppose to be natural and proper to the arteries, namely: a contraction followed by repose, during which elasticity, or the pressure of the contained fluid, causes dilatation. Wilson Philip, in his very elaborate account of experiments with animals,[4] states expressly that, through the nervous system (their natural channel of excitation), he could by no chemical or mechanical agency, induce any *irregular* action, either in the heart or arteries; the only alteration produced being that their propulsive movements were rendered either more or less powerful.[5]

[1] Edin. Med. and Surg. Journ., Jan., 1818.

[2] Recherches Physiologiques, p. 289.

[3] Medico-Chirurg. Transac., vol. vii.

[4] Philos. Transac., 1815, p. 442.

[5] Pflüger, it is true, has recently been able to cause contraction of the arteries of the web-membrane, by the application of electrical currents to the anterior roots of the crural nerves.—*Brit. and For. Medico-Chir. Rev.*, from *Schmidt's Jahrb.*, vol. lxxxix. No. 1, 1856.

The experiments of Wharton Jones, by section of nerves near the arteries, require a moment's attention.

The fact that section of the ischiatic nerve has but slight influence upon the contractile condition of the arteries of the frog's limb, only tends to confirm the *à priori* probability, that this nerve has no direct functional connection with the circulation in the vessels. That section of the nerve accompanying an artery is followed (after constriction) by dilatation, *greater below* than *above* the injury, agrees also with the supposition, that this, the arterial nerve, *has* a direct connection with its contractility. That when dilatation has followed the section of both the artery and its accompanying nerve, irritation of the web over the artery still causes contraction of it, even below the wound, suggests merely a comparison with the other instances, in which irritation of the distal end of a divided motor nerve causes a movement of the muscles which it supplies.

Division of the ophthalmic branch of the fifth pair of nerves (which anastomoses with the sympathetic), in the hands of Mayo and others, caused "ulceration and other signs of impaired nutrition of the eyeball."[1]

Budge, E. and E. H. Weber, Schiff, Brown-Séquard, Ludwig, Hoffa, and Lenz, have found that division or galvanization of the pneumogastric nerves produces arrest of the heart's action, or diminution of the pressure of blood in the arteries. Dr. Brown-Séquard[2] asserts that, when galvanization of the medulla oblongata near the origin of the par vagum has caused the heart to suddenly *cease beating*, this is not with a spasm or tonic contraction, but with the total *absence of contraction*. Let us study this observation along with the fact, that Longet[3] failed to obtain any such results by a similar mode of experimenting. Brown-Séquard explains this upon the supposition that his battery was *not strong enough*. Again, Wilson Philip[4] and Marshall Hall[5] succeeded in producing a temporary arrest of the heart's action in reptiles, by suddenly crushing the brain, or the stomach, with a hammer. We infer from all of these facts the great degree of violence necessary to cause any such effects by means of the pneumogastric upon the heart. They remain, therefore, as

[1] Todd and Bowman's Physiol. Anat., p. 510.
[2] Gazette Médicale, p. 332.
[3] Traité de Phys olo_ie, t ii. 2e partié, p. 211.
[4] Phil. Tiansac., 1815, p 78.
[5] Essay on the Circulation of the Blood, p. 160.

curious and unexplained facts, proving nothing physiologically,[1] certainly not that the office of the pneumogastric is to produce active dilatation of the heart. More probably, even, the reverse might be concluded. By simple section of the pneumogastric Bernard obtained, in dogs, a quickening of the action of the heart.[2] The experiments of Pourfour du Petit, Dr. J. Reid, and C. Bernard, upon the effects of dividing the sympathetic nerve, or removing its ganglia, will be alluded to presently. A few words, first, upon the *pressure of the blood in the arteries.*

Dr. Hales,[3] from experiments on animals, inferred that the pressure, alike in all the arterial trunks, is in man equal to a column of seven feet and a half in height; while in the veins, it is equal to a column of but six inches. Valentin and Mogk[4] found the pressure in the carotid artery to be 11 or 12 times that of the corresponding jugular vein.

Poisseuille[5] and Magendie also arrived at the conclusion that the pressure was alike in all the arteries, at every distance from the heart, and irrespective of their magnitude. Volkmann and Ludwig, with superior instruments, ascertained a difference to exist; the force diminishing gradually with the distance from the heart. Bernard, with a "double barometer" tube, has been able to obtain yet more accurate results.[6]

The pressure in the carotid was found to have an excess over that of the crural artery, of 30 millimetres in the column of mercury sustained. The pressure in the *central* end of the divided carotid exceeded that in the peripheral end, by about 40 millimetres. In the crural artery, this difference in pressure between the divided ends was 30 millimetres. The pressure in the peripheral end must be owing to the return-wave in the artery, which, in a number of cases was found to be pulsatile. As it varied with the artery (instead of being identical in all, as would be the case if it represented the mean pressure of the blood throughout the body),

[1] Pflüger states that irritation of the *nervi splanchnici* arrests the motion of the small intestines: as "another instance of the phenomenon, that the increased action of," or excessive action upon, "a nerve, stops the action of a muscle."—*Schmidt's Jahrb.*, vol. lxxxix. No. 1, 1856.

[2] Bernard and Robin on the Blood, p. 143.

[3] Phil. Transac., 1809.

[4] Henle and Pfeufer's Zeitschrift, 1845, p. 33.

[5] Magendie's Journal, t. viii. p. 272.

[6] Bernard and Robin on the Blood, p. 150. Vierordt is said to have devised a still more complete instrument, but I have at hand no account of his conclusions.

we must infer it to depend upon the *power* of the artery, namely: its muscularity; by which it reacts, upon distension, with more than equal force, and with a force different in different arteries.

After cutting the sympathetic trunk in the neck, a very great *increase of pressure* occurred in the facial artery of that side as compared with the other.

If the par vagum be divided, galvanization of the lower end diminishes the general arterial pressure; that of the upper end, increases it. Magendie found that touching the posterior root of a spinal nerve caused a *rise* of the mercurial column, while a fall was produced in it by touching the anterior root.

Bernard noticed that injection of *coffee* into the circulation augmented the pressure very much.

Ludwig observed that tying the arteries of the limbs, so as to increase the arterial pressure elsewhere, was followed by a great increase of the secretion of urine. Bleeding had a reverse effect; showing that *mechanical conditions* have direct relation to the escape of fluid from the kidney. In the salivary gland, no such accordance was found, in his experiments. This secretion is undoubtedly more under the direct influence (neuro-chemical?) of the nervous apparatus, than is that of the urine.

More particular attention must, however, be given to the experiments by Bernard (repeated also by Brown-Séquard), to show the effect of division of the sympathetic nerve.

It is stated, in the first place,[1] that section of the *fifth pair* has been by M. Bernard found to be followed by diminution of the temperature on the corresponding side of the head.

Section of the cervical filament of the great sympathetic, and particularly extirpation of the superior cervical ganglion, are followed by immediate augmentation of heat, and very great vascular turgescence in the ear, and all the corresponding side of the head. The arteries, more full, seem to beat with more force, and the circulation is more rapid. It has already been mentioned, that the pressure of the blood in the facial artery of that side is *increased.* In a few hours this arterial vascularity was lessened, although, as stated by the observer, the excess of temperature remained. *The capillary circulation remained always more visible in the hotter ear.*

An experiment by ligation of the veins of a rabbit's ear, proved

[1] Bernard and Robin on the Blood, or Comptes Rendus de la Societé de Biologie, 1853.

to bring other hypotheses, chemico-vital or physical, to account for it. But we have no need to attempt this.[1]

Galvanization of the cut end of the nerve reverses the phenomena, probably by stimulating the arteries engaged, to a violent tonic contraction, which acts like ligation, in producing a local anæmia; or, if the galvanic shock be very powerful, it may diminish the whole pressure of the arterial blood, by paralyzing the heart; in which case, the part affected, being alone under observation, would show the general loss of pressure and temperature to the experimenter. The former of these suppositions is, however, the more likely to apply.

We may now terminate our consideration of the experimental facts which tend to illustrate the arterial circulation, by a brief mention of some which have not yet been alluded to.

Spallanzani[2] observed the pulsation of the aorta in lizards after it had been tied with a double ligature, and even excised and placed upon the table.

Rosa[3] and Reinarz[4] are reported by Burdach as having seen, in *mammals*, the aorta to beat or oscillate rhythmically after being tied at two points and cut out.

Wilson Philip[5] excised the heart, in frogs, after tying all the vessels which led from it, and found the circulation of the web still to go on *vigorously*, sustained, as he says, by the *bloodvessels* alone, and showing no alteration from removal of the heart for several minutes. The term "bloodvessels" is used in his description; and as the pulsatile movement of the arteries is easily seen in the web under the microscope (Wharton Jones), we must infer that *this* movement made a part of the "vigorous," and, for a period, undisturbed circulation alluded to.

Dr. Stevens[6] plunged a hook into the heart of a rabbit, and then upon opening the thorax, found a branch of the coronary artery pulsating distinctly until quite empty.

[1] Kussmaul and Tenner infer, from their experiments on rabbits, that, in regard to temperature, the sympathetic nerve acts merely through the coats of the bloodvessels, by regulating their supply of blood.—*Brit. and Foreign Medico-Chirurgical Review*, July, 1856.

[2] Burdach's Physiol., t. vi. p. 347.

[3] Giornale per servire alla storia della medicina, t. i. p. 189.

[4] Dissertatio de irritabilitate arteriorum propriâ, p. 18.

[5] Philos. Transac., 1815, p. 440.

[6] On the Blood.

Kaltenbrunner[1] and Marshall Hall[2] repeated the experiment of Haller and Spallanzani, of excising the heart of the frog. Distinct oscillation of the blood, alternately forward and backward, was observed each time, continuing for ten or fifteen minutes.

M. Hall also discovered and described an artery in the frog, and in the toad, which pulsates distinctly for a considerable time after the heart has been removed.[3] The skill and experience of this experimenter forbid us to accept the suggestion of Müller, that the supposed vessel was a lymphatic heart.

With regard to the influence of the nervous system on the circulation, among very numerous observations, the following may be noted.

Burdach produced renewed contraction of the heart after death by galvanic stimulation of the cardiac nerves.[4] Valentin and others have repeatedly made the aorta to contract by stimulating the ganglia of the sympathetic.[5]

E. Home caused the carotids to pulsate violently by irritating the sympathetic nerve with potash.

Experiments by Wilson Philip, Le Gallois, and Clift,[6] showed that, in frogs and other animals, the circulation may go on in the heart and vessels after the brain and spinal marrow have been destroyed; although, during the existence of these centres, a great influence is exercised by them over the flow of blood; precisely as the spinal cord may maintain certain actions of the voluntary muscles, in the absence of a brain, although, during its presence, the brain maintains their subordination. By exclusion, these experiments, with others, would seem to throw the burden of the nervous control of the heart and vessels upon the ganglionic system, essentially; while the relation of mutual influence and dependence, of this system, upon the cerebro-spinal, has been shown by the experiments of Flourens, Cruveilhier, Valentin, Longet, and others.

W. Philip established also the fact, that, as compared with the voluntary muscles, the heart obeyed a much less intense and power-

[1] Magendie's Journal de Physiol., t. viii.

[2] Essay on the Circulation of the Blood, 1832.

[3] Op. citat.

[4] Cyclop. of Anat. and Physiol., art. *Irritability*.

[5] Simon's Pathol., p. 60; and Brit. and For. Medico-Chir. Rev., Oct., 1854. Callenfells proved the arteries of the *pia mater* to be under the influence of the sympathetic nerve in the neck. The term *vaso-motor*, as applied to nerves, is finding its way into physiology.

[6] Phil. Transac., 1815, p. 78, 89, and 91.

ful degree of stimulation; but that, while these muscles would respond to stimulation applied to very minute parts of the nervous system, the heart was only affected when the application extended to a considerable portion of the nervous apparatus. It was found, in the experiments of this observer, that the circulation in the small arteries and capillaries was much more speedily arrested by suddenly *crushing the brain*, than by excising the heart.

Prof. Brown Séquard recently (Jan. 21, 1855), takes date of the discovery[1] that the pneumogastric nerves are the principal *motor nerves* of the small vessels of the lungs; having before made an announcement of the observation that they exhibit the function of motor nerves of the vessels of the heart. The facts given are,

1. That the section of the pneumogastric nerves in the cervical region, is followed by the dilatation (or paralysis) of the small vessels of the lungs, as well as by the dilatation of the vessels of the heart.

2. That the galvanization of these nerves in the cervical region, after they have been carefully separated from the sympathetic, produces contraction of the vessels of the lungs, as well as that of the vessels of the heart.

Instances of *irritation* of different *nerves* apparently producing *inflammation*, are to be found in various places; as, in the *Philosophical Transactions*, for 1814 (p. 583); in the *London Medical Gazette* (vol. i. p. 534); and in the *Medico-Chirurgical Transactions* (vol. vii. p. 191). Inflammation of the hoof bone, in the horse, on the contrary, Hausman[2] cured by cutting the nerves of the fetlock.

Having exhausted the space which, in this essay, should be devoted to experimental allusion (although by no means consuming all the material which could be accumulated in regard to it), let us endeavor to apply the considerations which have been given, with a few additional facts, to that portion of pathology which most immediately concerns the arterial and capillary systems.

V. INFLAMMATION.

The history of all the theories, facts, experiments, and arguments given forth upon the subject of inflammation, would become a very

[1] *Vide* Le Gallois on Life, p. 205. Phila. ed.
[2] Henle's Pathology, p. 266.

voluminous document. To relate all that has been said in regard to it by the leading writers alone, would be irrelevant to our present purpose. In the writings of Hunter, Wilson Philip, Wharton Jones, and Lebert, are to be found all the principal facts and most careful reasonings upon the subject. But in regard to the condition of the bloodvessels in inflammation, no just theoretic expression of the observed data has been attainable, while their physiological laws and habitudes were undetermined.

For example, in a recent work by even so admirable a writer as Paget,[1] we find the possibility, at least, asserted, of the arteries "dilating, as of their own force, with that which Mr. Hunter called active dilatation, and compared with the act of dilatation of the os uteri." Now, while we are quite prepared at present to deny the occurrence of any *active* dilatation of the os uteri, so far as the fibres of the *os* itself are concerned, we may controvert the theory thus suggested, most directly, by another quotation from Mr. Hunter himself. Singular it was, indeed, that even he should forget, for a moment, his philosophy, in treating of inflammation. Hunter states, at the outset of his treatise on the vascular system,[2] that "in a muscle, the active state is that of contraction; the state of rest is merely the state of inaction. The contractile state of a muscle, as well as the relaxed, arises from a power inherent in itself; but the recovery or *elongation must depend on some other power.*"

The above quotations serve to show the confusion of language prevailing upon the subject of inflammation. A similar example may be found in the pathological definition of the process, in the works of Dr. Williams,[3] and of Handfield Jones and Sieveking,[4] as one in which the "movement of the blood in a part is *partly increased and partly diminished.*"

What are, then, to be brief, the *facts* in regard to inflammation? In order to apprehend them, the common conditions of all tissues capable of inflammation, must be considered. An ideal section of the *cutis vera*, for example, presents the following objects to the mental vision: 1. A certain organized structure of cells, fibres, and membranes; with certain affinities for matters contained in the blood; having a power, on reception of those matters, to shape them after its

[1] Surgical Pathology, p. 198.
[2] Works, vol. iii. p. 150.
[3] Principles of Medicine, p. 225.
[4] Pathological Anatomy, p. 117.

own type, and existing only in a constant state of molecular change or movement, of a particular kind, consisting of the removal of one set of particles, and their renewal by another set. 2. Capillary vessels, of a single coat, not muscular, fed with blood by small arteries, which are branches of larger ones; and emptying into veins. 3. Nerves, sensitive, motor, and ganglionic, distributed *both* to the tissue and to its arteries. 4. Lymphatic vessels, originating minutely throughout the part. These anatomical elements may be affected with various changes, as atrophy, hypertrophy, venous congestion, active hyperæmia, tubercle, cancer, gangrene, &c. But what is the nature of those causes which determine *inflammation* in the part?

Not section of the nerves: nor division of the arteries (*per se*); nor division of veins; nor ligation of arteries, nor of veins; nor (*per se*) of lymphatics.

Only such causes as modify the *molecular state* of the tissue, and alter the interchange of material between the tissue and the blood, induce any *permanent* modification of *excitement* or *depression*, in the circulation.

An increased *stimulation*, of a not abnormal kind (undoubtedly acting through nervous agency, as suggested by Unzer, Henle, and others), increases the activity of the circulation in the part, through its arteries; it being in *these vessels alone*, that any variation in activity can take place. This constitutes *active hyperæmia*.

A destruction or modification of part of the tissue, in such degree or manner as to *arrest* the regular interchange between the part and the blood, *can alone cause inflammation*. This is the starting point. Latour[1] has shown how important a contributing cause, in nearly all inflammations, is the access of an undue supply of oxygen; producing, under arrest of the life-force, an excessive development of heat, by combination with the elements of the tissues and blood, in a manner ordinarily controlled by life.

At this point we may assume, with advantage, the path of observation laid out and described by Wharton Jones, in his admirable essay.[2]

As to the state of the blood and the bloodvessels, which constitutes the first step to the inflammation of a part of the human body, excited by the exposure of some other part to cold and wet,

[1] De la chaleur Animale, comme principe de l'Inflammation.

[2] Guy's Hospital Reports, 1851, p. 55.

Mr. Jones observes, that we "cannot conceive any other condition in operation than constriction of the small arteries, and the consequent sluggish flow in them, with accumulation of red corpuscles in the capillaries and venous radicles. This being so, the question arises, how is the constriction of the small arteries called forth? It is generally agreed, that the organ which is affected, is the *weak organ* of the body at the time. In that organ we consider, that the small arteries are more irritable than in the other organs, and are, therefore, more readily excited to contraction by the impression communicated to them, in common with other organs, through the nervous system. It is only in the commencement that I consider constriction of the small arteries exists." Mr. Jones quotes a case from Sir Charles Bell, in which the conjunctiva of a patient was so insensible, that touching it caused no winking, although it produced injection of its vessels. This shows, of course, very clearly, that the nerves of the arteries may act (probably by their *own* reflex ganglionic connection), independently of the sensitive nerves.

From all the reports of observers, everywhere, we may assert that, when a mechanical, chemical, or other irritant has deranged the molecular movements in a part to an inflammatory degree, an aggregation of the red corpuscles (and possibly of the colorless also) occurs, they displaying an unusual attraction for each other. This was, not too fancifully, compared by Prochaska to the electrical attraction of light bodies rubbed with glass or resin. Nor do we dread the smile which may await the suggestion, no longer (since the ratiocinations of Grove, Liebig, and Carpenter) forbidden the light, that, in the arrest of normal movement occurring in inflammation, vital force may be converted into heat, and *statical* electricity.

We may unhesitatingly reject the view of Wharton Jones and Henle, that *viscidity* of the plasma causes the aggregation of the corpuscles; as this viscidity only follows, if at all, later than that aggregation, upon the effusion of plasma from increased hydraulic pressure in the part.

Nor is there reason, according to the most authoritative testimony, for adopting the opinion of Williams, that an excessive development of the colorless corpuscles may be a causative event in the series.

The next element in importance, although possibly antecedent in time, is the change in the diameter of the arterial trunks, and in the flow of blood in them.

Immediately after constriction has been produced by ar
his is followed by *dilatation.*

Wharton Jones has clearly illustrated, in his experim
:inds of arterial dilatation.

The first, is attended with retardation, or even tempor
grade movement, of the blood, in the vessel.

This is produced by the section of the nerve accompa
rtery.[1] The simple relaxation and dilatation of a vessel c
physical principles, produce no other result.

The second, is described as the result of irritation; "
dilatation of an artery, *with coincident acceleration of the blood.*"[2] What is the nature of this change?

Hunter ascertained that the vessels of an inflamed part actually *enlarged;* as in his famous preparation of the rab Every one has perceived the more forcible throbbing and enlargement of arteries near an inflamed spot. That a quantity of blood is flowing through such arteries in a giv is proved, as stated by Lawrence, by the great escape c from integuments divided by incisions in erysipelas; and, larly, by his well-known experiment, of opening a vein in e at the same time, in a patient one of whose hands was in when *three times* as much blood flowed in the same period, vein of the inflamed limb, as from that of the sound one regard to the seat of inflammation itself, it has been establis *only during the active hyperæmia which precedes inflammatio* flow of blood more rapid: after this, it is well remarked Jones, that "the part which is the actual seat of inflammati be distinguished from the *surrounding* parts of the inflame It is *into and in the latter* that a greater quantity of blood en circulates."[3] Stagnation is undoubtedly the condition of which has become the seat of established inflammation; w pressure of blood from the enlarged arteries in which the *would* be increased *but* for the stagnation which opposes the cause of the *effusion*—which Alison and others very justly e essential to true acute inflammation.

But, what is the rationale of the above-described "dilat arteries with *acceleration of the flow* of blood" in them?

Every tube which undergoes simple widening, or inc

[1] Guy's Hospital Reports, 1851, pp. 32, 33.
[2] Guy's Hospital Reports, 1851, p. 18.
[3] Op. citat., p. 57.

calibre, *must* diminish, by this fact, the velocity of the flow of fluid through it. How, then, is the acceleration named, to be accounted for? By an *added* impulse, of course, either of the *vis a tergo*, the *vis a fronte*, or of its own contractile propulsion.

The *vis a fronte*, or vital affinity—the *nutrition force* as it may be called—is, in the case of inflammation, altered only by arrest or diminution. The escape of plasma is not nutrition; the coagulation of exuded lymph is not nutrition: the formation of products such as pus-cells, adherent membranes,—or other deposits, show no excess, but rather a feeble effort of nutritive power. The writer has upon his own person a very clear evidence of this. One forefinger, the first joint of which became the seat of a violent inflammation, terminating in pus-formation after about ten days, grew *smaller* from that time, and has continued, ever since, in all proportions except length, not much more than half the size of the same finger upon the other hand.

The *vis a fronte*, then, being in abeyance,—it must be the *vis a tergo* which has accelerated the flow of blood. From whence? Not from the heart—as its impulse is alike to every part;—and the phenomenon named is observed when no disturbance of the general circulation has occurred. It *must* be, then, the arteries themselves which undergo an increase in the power of their propulsion. This is a true, *active enlargement.*

We see it more permanently in the uterine arteries during gestation; in the spermatic artery in the heat of male animals; in the carotid of the stag when the young horn is growing, &c. &c.

I believe the arteries to be not only capable of reflex action, but to be, themselves, *erectile tissues.* The vasa vasorum are supplied from other vessels. Hunter[1] says, that on laying the coats of arteries bare in the living body, we can discern their vessels more evidently, some little time after the exposure; "for then, they become vessels carrying red blood, as in a beginning inflammation; *growing turgid*, when the arteries may be easily discerned from the veins by the difference of color of their blood."

Arteries, when thus enlarged, grow, usually, more tortuous. Their force of contraction must be greater;—as *every muscle contracts most forcibly when supplied with an abundance of oxygenated blood.* Observe, then, what Sir Charles Bell[1] remarks:—

"The excitement of a hollow muscle does not consist merely in contraction, but also in the free and perfect relaxation which fol-

[1] Essay on the Circulation, p. 58

lows the contraction. The conclusion is, that a tortuous artery becomes *more capacious, more active;* that its activity becomes less dependent on the force of the blood transmitted from the heart, and more on the excitement of the organ which it serves."

This is a most important dictum in connection with the vascular pathology of inflammation. The effect of cold applications, in such a state of the bloodvessels, must be sedative and resolvent chiefly in two modes: 1. By diminishing the actual *volume* of the blood in the part, and the consequent irritation of distension; and, 2. By removal of the stimulus of heat from the nerves of the inflamed part. A constricting influence upon the vasa vasorum, exerted by cold, will also lessen the *turgor vitalis.*

It must be remembered, however, that, after *stasis* has been completely established at the focus of irritation, the capillaries about it must become distended, and, from them, finally, as observed by Wharton Jones, a passive dilatation must extend along the small arterial trunks. So much of the pressure exerted by the vessels as does not, at that time, find relief by the effusion produced, must expend itself in their dilatation; and *this effect may remain* after the irritation and even the stasis have subsided. In *this* condition, cold, nitras argenti, and other local *stimuli*, may dissipate the remains of the inflammation, by producing constriction of the small arteries, and thus allowing the elasticity of the stretched capillaries to restore them to their ordinary dimensions.

On the whole, we can hardly better describe the whole condition of a part during the inflammatory process, than in the following words of a late writer.[1] "Acute inflammation has for its main features: 1. Hypersæmic afflux; 2. Partial and local stasis; 3. Impairment or complete arrest of the nutritive actions of the part; 4. Exudation of plasma in excess, the more so, as the part is unable to use its ordinary proportion." It is well said also by the same writer, that from this typical condition most if not all the instances of what is called "chronic inflammation," deviate, in other respects than in being of slower course.

I would define inflammation as *a local lesion of nutrition, with concentric vascular excitement, resulting in exudation.*

[1] C. Handfield Jones, in *Association Medical Journal*, 1853, p. 1078. Mention should also be made, however, of the breaking up of the arrested blood corpuscles in an inflamed part, and the escape of their potash and phosphatic salts; which, according to Lehmann, favor very much the plasticity of the effused fluid. (*See* Lehmann's *Physiol. Chem.*, Phil. ed., vol. iii. p. 145.)

What is the cause of that arrest of the blood in the capillaries of the lungs, which is observed to be the first step in asphyxiation?

An explanation of it may be approached by the consideration of a few facts.

Dr. T. Castell[1] found that the hearts of frogs, after excision, when placed in oxygen gas, continued to beat for 720 minutes; in air, 180 minutes; in no other gas more than 72 minutes; and under the air-pump but 30 minutes. Oxygen is, then, a direct stimulant to the muscular action of the heart; and, it is to be inferred, to that of the arteries also. Now, *no stimulus will act upon the contractility of a muscle through reflex nervous agency, or conduction, which is not capable of acting upon it when directly applied.* And the converse of this proposition is true. Therefore, oxygen, as contained in the air and in the blood, may be expected, as Bichat[2] believed, to prove the "natural stimulus" of the circulation, and pre-eminently of that through the lungs. We may consider Bichat to have been right in the opinion, that obstruction of the blood in the pulmonary vessels is the result of the "non-excitement" following from a deficiency of this element; a non-excitement occurring not only with regard to the muscular tissue of the arteries themselves, but affecting also the indirect or reflex influence of their nervous connections.

Brown-Séquard has asserted the pneumogastrics to be the motor nerves of the small vessels of the lungs. Le Gallois anticipated this observation[3] with his experiments, proving that animals died after the section of their nerves, with extensive passive engorgement of the lungs.

All physiologists acknowledge the eighth pair to be the afferent medium of the reflex series, in those movements which constitute respiration by means of thoracic muscular action.

Both of these movements, then, are necessary; the movement of the blood, propelled by the arteries through the lungs, and the movement of the ribs and diaphragm in inspiration. Both are reflex actions, in part at least.

[1] Müller's Archiv., 1854.

[2] On Life and Death, Part ii., chap. vi.

[3] On the Principle of Life, p. 205–215.

Add to these the "capillary force," supposed by Prof. Draper to be the *only* source of power in the pulmonic (as well as in the systemic) circulation (the attraction, that is, in this case, of carbon in the blood for the atmospheric oxygen), and we have all of those conditions whose absence must produce asphyxia.

That carbonic acid,[1] or a "venous state of the blood," is not the direct, or even reflex cause of the respiratory act, is shown by the simple fact, that in an atmosphere excessively carbonized, as in wells or mines, or in a room filled with charcoal vapors, so far from any *excitement* of the inspiratory action occurring, it is precisely the reverse; and the patient sleeps or dies without a struggle. In pure oxygen, on the contrary, the respiratory movements, with all others, in animals exposed to it, are exceedingly active.

VII. FEVER.

Müller suggested in his Treatise on Physiology, that an influence (that of a local irritation, for instance), "propagated through the means of the *sympathetic nerve radicles*, may have a main share in the phenomena which we call fever."

Dr. H. F. Campbell, in his Report "On the Nature of Typhoid Fevers,"[2] has elaborated a similar pathological view. Acknowledging fully, as has been already seen, the validity of the doctrine of the physiological dependence of the vascular apparatus directly upon the ganglionic system, the present writer would suggest, with diffidence, the following, as a brief classification of fevers, in regard particularly to the share which the circulation may have in their phenomena.

1. Irritative; *e. g.*, Phlegmasiæ; in which the irritation extends directly from the local centre of vascular excitement, to the circulation generally.

2. Reactive; such as the fever which follows a *chill;* in affections of which the *chill is the paroxysm*, or primal condition of the disorder, the fever being merely secondary.

3. Zymotic; or, preferably, perhaps, *Hæmatoxic;* in which the blood and nervous system are both engaged, and in which the circulation is affected both by the change in the character of the

[1] The writer is well aware of the theory and arguments of Dr. Brown-Séquard upon this subject; but cannot (as above shown) regard them as at all satisfactory.

[2] Transac. of Am. Med. Associa., 1853, p. 464.

blood, and by the altered influence of the nerve centres. Such are the Exanthemata, Typhus, and Cholera in its stage of secondary fever.

It must be admitted, however, that this scheme only indicates the *direction* in which inquiry may tend, toward the solution of the problem of the pathogenetic nature of the febrile movement; a problem which even the efforts of Virchow have not succeeded in stripping of all its difficulties.[1]

There is, perhaps, something dogmatic in Virchow's definition of fever, as consisting "essentially in *elevation of temperature*, which *must* arise from increased consumption of tissue, and appears to have its immediate cause in alterations (abnormal tension-condition) of the nervous system." But there is much value in the observations[2] made by this writer, by A. Vogel, and by Dr. E. Parkes, all tending towards a similar conclusion. Out of place as it would be to discuss this subject *in extenso* in the present essay—one point only may be further noted. Dr. Parkes[3] refers, as a fact of importance, to the "remarkable *retention of water* in the febrile system;" as shown by the scanty urine, deficient perspiration and defecation, along with great thirst. He suggests that the explanation of this may be, the formation in the blood, by rapid metamorphosis of albuminous substances, of gelatinous compounds, which have an extraordinary affinity for water. This being granted as probable, I still think, that somewhat must be due to the *condition of the bloodvessels.* In the cold stage of a febrile paroxysm, many of the arteries are rigidly contracted; as they are, in a yet greater degree, in the cholera attack. When *fever* comes on, it is coincident with, or, perhaps, partly consequent upon, the *dilatation* of the vessels, which so commonly follows a rigid contraction. In this dilated state, they must of course retain, and tend to absorb, a larger quantity of water; and thus may we explain, in part at least, the dryness of the surface, and of the membranes of the body, in fever. The reverse of these phenomena, as already suggested, probably constitutes an important condition in the cholera-*collapse.*

[1] Handbuch der Speciellen Pathologie, &c.; *vide* Brit. and For. Medico-Chirurg. Review, April, 1855.

[2] Brit. and For. Medico-Chirurg. Rev., April, 1856.

[3] On Pyrexia; Gulstonian Lectures, 1855.

VIII. THE PULSE.

As a hydraulic phenomenon, we may consider that the arterial pulse should be capable of explanation, chiefly upon physical principles.[1]

From the pages of works upon physics,[2] therefore, we prefer to take our main estimate of the conditions to be studied in regard to it.

These conditions are: 1. The propulsion of a wave in the blood, commencing at the aorta, with each introduction of a new amount of blood by the systole of the ventricles. (Colt.)

2. Contraction of the arterial walls, by virtue of their muscular coat. (Hunter and C. Bell.)

3. Lengthening and locomotion of the vessels, sensible to the touch. (Bichat.)

4. Transmission of the impulse, or heart-stroke, like the passage of sonorous vibrations, through the blood, as well as through the walls of the vessels. (Arnott.)

5. The rush forward of the blood, from the introduction of a new portion; which is most sensible when the finger is pressed somewhat upon the artery. (Young, Parry.)

All of these conditions are necessary to the formation of the normal pulse; and, by their respective variations, all the different shades of pulsation are caused.

Our task is, chiefly, to define the share taken by the arterial muscular coat in the process.

Is this share nothing, or is it that of *tonicity*, like the sphincters'; or, is it alternating, either with a sudden rigidity after the heart-impulse, or more properly vermicular?

That it is not completely null, is shown by the fact that an artery, when distended, always reacts (Poiseuille)[3] upon the pressure with a force *greater* than that of the distension. This cannot be accounted for by elasticity alone.

The question lies, then, between the supposition of mere tonicity, and that of alternating action.

[1] The principal authors and experimenters upon the physiology of the pulse, have been Arthaud, Weber, Poiseuille, Flourens, Young, Parry, Volkmann, Colt, and Alison.

[2] Arnott's Elements of Physics, ed. by I. Hays, M. D., Philada., 1829; and T. Young, in Philos. Transac. 1808 and 1809.

[3] Magendie's Journal, loc. citat.

ments, did the intestinal canal upon its contents, and as the womb does, at full term of pregnancy, upon the fœtal mass. To use a familiar illustration—the muscularity of the dragoon's adductors is, similarly, the cause of his *not* rising from his seat in the trot. If he were not to adapt himself, by their contraction, to all the movements of his horse (as is the case with the bad rider), then he would rise out of the saddle with every step. So, the greatest amount of dilatation is to be found in the larger arteries, where elasticity predominates; and the least, in the smaller ones, which are more muscular.

Again, the *elongation* of the trunk of an artery must *follow* from the contraction of its transverse or oblique muscle-fibres; as every muscle grows thicker when it contracts. Hunter proved, experimentally, that the artery of the penis thus gains one-fourth of its length in contracting; while other vessels gained one-tenth, one-twelfth, one-seventeenth, &c.[1] The elongation so constantly observed in a pulsating artery is very much to be accounted for in this mode.

The pulse is *not* imitated, according to Arnott,[2] with any degree of accuracy, by filling the vessels of a dead body, and then propelling more fluid into them with a syringe. Sir Charles Bell asserts that an artery, opened during such an experiment, will merely ooze, not jet. De Gorter proved that even to produce *this* effect, a force is required double that of the animal's heart. Yet, in the living animal, a divided artery of the diameter of a pin, will throw out a jet of three or four feet.[3]

The *velocity* of the propagation of the pulse is not such as, upon physical principles, we should anticipate,—were the only forces engaged, the heart's impulse, and the elasticity or even tonicity of the vessels. In the matter of velocity, this latter property, of tonicity, would approximate them to rigid tubes, carrying, as Young and Arnott both say, the impetus of the systole with immeasurable rapidity. Leaving muscularity out of the question, Young estimated, from hydraulic calculations, that the vessels, as elastic tubes, ought to convey the pulse at the rate of forty feet per second. But, considering their *tension* (shown by the flow of blood from any divided part of the circulation), ought it not to be much more rapid, if the heart's impulse were the only cause? Sonorous vibrations

[1] Works, vol. iii. p. 165.
[2] Op. citat., p. 438.
[3] Bell on the Circulation, p. 3.

travel through water nearly a mile in a second; and through solids still faster. And the language of Arnott upon this subject is quite apposite: "That a tangible shock is conveyed through a fluid without any apparent accumulation of it or change of velocity, and much in the manner of sound, is proved by the fact, that we may discover the working of a water-pump at very great distances, through iron pipes connected with it, and even through elastic pipes of leather, as those of a common fire-engine, from which the water is spouting, nevertheless, in a uniform stream."[1] Dr. Young supposed the pulse to be exactly synchronous over the whole body; and, treating of the supposition of a muscular contraction of the arteries occurring in connection with that of the heart, he states that if such a contraction should follow the impulse of the heart with a velocity somewhat smaller than its own, *power would thus be added*, and *velocity lessened* by the arteries; and the pulse would become (proportionately) fuller and fuller as it goes on.

He objects to this, because it *had not been proved*. But it was proved by Hope[2] that such is the mode of contraction in the alternating movements of the heart. It is stated by this observer that "the auricles contract so immediately before the ventricles that the one motion is propagated into the other, as if by continuity of action; yet the motion is not so quick that it cannot readily be traced by the eye." It is singular that the synchronous occurrence of the pulse in all parts of the body should ever have been supposed, when it is so easy to verify the contrary by a simple observation. An interval of about one-thirtieth of a second exists between the beat of the heart and the pulse in the facial artery,—one-tenth to one-twelfth between this and that at the wrist, and one-sixth is allowed, by many observers, to intervene between the heart's impulse and that of the peroneal artery. I have ascertained recently, in the person of an individual in ordinary health (by placing my ear upon the chest and a finger upon the wrist), that the pulse was exactly synchronous with the commencement of the *second sound*. Dr. Carpenter mentions cases in which it even *followed* this.[3] Now, an interval of one-sixth of a second in traversing less than five feet, shows a velocity of only thirty feet or less in a second—which is consider-

[1] Op. citat., p. 459.

[2] On the Heart, p. 28. The very interesting case of A. Graux, recently examined by numerous physiologists in Europe, strikingly confirms this observation.—*Lancet*, June 23, 1855.

[3] Human Physiol., p. 488.

ably within Young's hydraulic estimate, and very much more below that required by the comparison with sound, sanctioned by Dr. Arnott.

There is, in fact, little doubt of the existence of two waves: the one that of the impulse from the heart, propagated in the manner of sonorous undulations; and the other that of the true arterial systole. These are theoretically separable, although, ordinarily, the pulse is a compound of the two. Yet Dr. Williams[1] has shown that in the *dichrotous* pulse they are separate; while deficient tonicity of the vessels in other cases is accompanied by a longer interval between the pulse and the beat of the heart—and an excess of that quality approaches the vessels more nearly to rigid tubes, making the succession almost instantaneous.

The objection of Dr. Young to the theory mentioned, upon the ground of the asserted *velocity* of the pulse—being thus done away with—let us consider the force of that which concerns its *power*. An important element of the discussion is involved in this.

The effect of the elasticity of the arteries is, to render the flow of blood uniform; upon the very familiar principle (that of the double bellows, the fire-engine, and the hydraulic ram), that "an intermitting movement may be converted into a continuous one, by employing the original force to compress a reservoir or spring, which keeps up a constant reaction."

Thus, the alternating impulse received from the heart would be altogether reduced to an equable flow, long before it reached the capillaries, were it not seconded, as believed by Hunter,[2] just where it begins to fail, by the contraction of the arteries. It could not otherwise happen that, as it is reported by Haller, arteries of not more than one-sixth of a line pulsate visibly to the naked eye, and that, under the microscope, Spallanzani should find them to do so in every magnitude, so long as they had the character of arteries.[3] But, another evidence of the *power* of the arterial pulse, has been beautifully alluded to by Sir Charles Bell.[4]

When one leg is twisted over the other knee, and the foot is held suspended, a distinct movement occurs in the limb with every pulsation, and the toe will pulsate and rise, although the foot may be *loaded with a hundred pounds*. But, only one-fifth of the whole force of the left ventricle can be exerted towards this effect; and

[1] Princip. of Med., pp. 98 and 180.
[2] Op. citat., p. 171.
[3] Cyclop. of Anat. and Physiol., vol. i. p. 664.
[4] On the Circulation, p. 68.

the leg is, also, a lever of the third kind. Moreover, we know that a very few pounds will suffice to stop the pulsation of the crural artery at the groin. It follows, necessarily, then, that it is by no means the heart, nor the popliteal artery alone, but *the pulsation of the smaller arteries within the fleshy substance of the limb* that produces the result. All difficulty with regard to the power of the vessels is removed by this proof.

A pulsatile movement of the blood through the capillaries occasionally occurs, under morbid conditions; and those conditions are always those of weakness. The arterial pulse is, in such cases, carried beyond its ordinary range, the tension which should balance it being defective.

The second sound of the heart is universally acknowledged, not only upon theory, but from absolute demonstration (Valentin), to be produced by the shutting together of the aortic and pulmonary semilunar valves, after the ventricular systole has ceased.

Let us, then, remember the loudness and force of this sound, and its distinct separation from the first. It is not by so much as a moiety of magnitude removed from the first, which is caused by so many kinds of movement, viz: the muscular friction of the ventricles, the tension of the auriculo-ventricular valves, the impulse, and the churning of blood in the cavities of the heart and its rush into the open vessels. Now, place against all these powerful causes of sound, the *one* feeble one, which some theorists would suppose to be the cause of the second, by closure of the arterial valves, namely: the *elasticity* of the arteries! Yet, the second sound is often more than half as loud as the first. It is not possible, I think, that such an effect should be produced by such a cause alone.

I believe that Hunter is perfectly correct in the expression, however *obsolete* it has been pronounced to be, that "the heart needs only to act with such force as will be sufficient to carry the blood through the larger arteries, and then the muscular power of the arteries takes it up, and, as it were, removes the load of blood while the heart is dilating."[1]

Let any one, with a vigorous circulation, try the experiment adduced by Sir Charles Bell; and, at a time, at least, when the move-

[1] Op. citat., p. 171. A recent writer in the *Brit. and For. Medico-Chir. Rev.* (Jan., 1855), observes, *per contra*, that "*those obscure notions about a vermicular contraction need no reply.*" True; they need only elucidation, and analysis.

ments of the heart are quite sensible, as after a hearty meal, it will be possible to *trace* the successive flow of the blood, by one's own consciousness, under the throes of the whole aortic system, from the centre to the extremity.

Dr. Arnott, although denying the participation of the muscularity of arteries in the pulse, with a vagueness of terms which his American editor, Dr. Hays, has not failed to note, yet observes that the rigidity of the vessels may *possibly* increase at the moment of the pulse; and that there may be not much difficulty in supposing a momentary stiffening or slight contraction of the whole arterial system, such as the rising of the mesenteric tree would suggest. He very properly remarks, also, that, "if there be such, it is still dependent on, and proportioned to, the action of the heart; for it occurs only with that of the heart, it indicates any disturbance of the heart's action, and, at death, it ceases in the remote extremities first."[1]

There is no difficulty in acknowledging all of this direct connection and dependence, without detracting at all from the special importance of the arterial power in the circulation.

It is a relation constantly seen, even between different systems, in the higher animals, and still more in the different parts of the same system or apparatus. I can find no better mode of expressing the nature of this dependence than in that of the explanation given by Longet[2] of the existence of peculiar functions in the ganglionic portion of the nervous system, while it is still indissolubly subjoined to the cerebro-spinal axis, whose injuries affect it, "comme on voit, dans une machine, *l'arrêt du rouage principal produire l'immobilité soudaine des rouages sécondaires.*"

It is evident that our appreciation of the pathology of the pulse must be very much influenced by the view taken of its physiological rationale; and, as Dr. Dunglison has very well remarked,[3] most of the theories in regard to it take the contractility of the arteries too little into account. We cannot at all explain many of these variations with which every practitioner is familiar, without reference to the varying condition of the arteries, as to tension, flaccidity, &c., which, in acute disorders, at least, must affect the muscular coat alone.[4]

[1] Op. citat., p. 464.

[2] Physiologie, t. ii. p. 380.

[3] Cyclop. of Pract. Med., Am. ed., art. *Pulse.*

[4] The attention of the reader may be again called to the case, recently reported by Dr. A. Flint, in which reduplication of both sounds of the heart occurred, the

RÉSUMÉ.

We conclude, as the summary result of the foregoing investigation—based, as we have seen, upon the combined facts of *History*, *Analogy*, *Experiment*, and *Pathology*—that the most probable opinion or theory is (in opposition to most recent authorities,[1] but in accordance with the views of Hunter and Sir Charles Bell, and partially with those of Carpenter), that, as all the arteries have a muscular coat, this is endowed, like the other muscular tissues of hollow viscera, with a power of alternating contraction and relaxation;[2] that this contraction is exerted in immediate connection with, and succession upon, the beat of the heart; *the arterial systole thus combining with that of the ventricles to make up the pulse:* that the variation occurring in different parts of the circulation is to be accounted for to a considerable extent, although not entirely (a capillary power or nutritive affinity being also acknowledged), by the different degrees or kinds of *action* of the arteries; that the normal modes of stimulation by which these vessels are affected are chiefly three: 1. That of *distension*, from the impulse of the heart; 2. The stimulus of *oxygen*, in the red corpuscles of the blood, by which all muscles are maintained in activity; and 3. The direct (*and reflex*) influence of the *nervous system*, by means of the arterial or vaso-motor nerves;[3] lastly, that it is by the centres of the Sympathetic system that the principal control is maintained over the arteries, as well as over the heart; while they are subjected, also, to influences directly transferred or reflected from the Cerebro-spinal axis, and to some which result from contact with the external world. The further consequences of these conclusions, as applied to Pathology and Therapeutics, would constitute too extensive a subject for the present essay.

pulse *not being synchronous* with the beat of the heart; the latter, in fact, being *double* the rate of the former at the wrist. (See *Western Journal of Medicine and Surgery*, April, 1855.)

[1] Magendie, Henle, Weber, Kölliker, Simon, Savory, Paget, Arnott, &c. &c.

[2] Substituted by a *tonic* or rigid contraction, under certain *abnormal* and exceptional circumstances.

[3] The effect of *venesection* in the treatment of inflammations may be clearly understood according to this view; as, by diminution of the quantity of the blood and of the number of red corpuscles, all of these conditions of stimulation may be reduced, either directly or indirectly.

If there has been any cogency in the course of reasoning which has thus been brought to a termination, it will appear that, by those who have adopted an opposite view, the most obvious things must have been often overlooked, and the simplest opinions rejected; perhaps, from a too great love of the mysterious and difficult in natural science.

It will have been, in that case, I trust, not an idle task, to show how *undue weight* has been given to *experiments*, the exact *meaning* of whose results is a question of *difficult* and most *uncertain solution:* or, to protest, in the language both of reasoning and of facts, that, to doubt the certainty of *great natural Laws*, as expressed in *clearly defined and well ascertained analogies*, is, to a certain extent, a treason against Science: since, in whatever direction or department of the κοσμος intelligence may act, it must still discover, under the same Unity of Power, but ONE TRUTH.

PLAN OF ORGANIZATION

OF THE

AMERICAN MEDICAL ASSOCIATION.

PLAN OF ORGANIZATION.

REGULATIONS.

I. TITLE OF THE ASSOCIATION.

THIS institution shall be known and distinguished by the name and title of "THE AMERICAN MEDICAL ASSOCIATION."

II. MEMBERS.

The members of this institution shall collectively represent and have cognizance of the common interests of the medical profession in every part of the United States; and shall hold their appointment to membership either as delegates from local institutions, as members by invitation, or as permanent members.

The Delegates shall receive the appointment from permanently organized medical societies, medical colleges, hospitals, lunatic asylums, and other permanently organized medical institutions of good standing in the United States, and from the American Medical Society in Paris. Each delegate shall hold his appointment for one year, and until another is appointed to succeed him, and shall participate in all the business and affairs of the Association.

Each local society shall have the privilege of sending to the Association one delegate for every ten of its regular resident members, and one for every additional fraction of more than half of this number. The faculty of every regular constituted medical college, or chartered school of medicine, shall have the privilege of sending two delegates. The professional staff of every chartered or municipal hospital containing a hundred inmates or more, shall have the privilege of sending two delegates; and every other permanently organized medical institution of good standing shall have the privilege of sending one delegate.

Delegates representing the medical staffs of the United States Army and Navy, shall be appointed by the Chiefs of the Army and Navy Medical Bureaux. The number of delegates so appointed shall be four from the army medical officers, and an equal number from the navy medical officers.

The Members by Invitation shall consist of practitioners of reputable standing, from sections of the United States not otherwise represented at the meeting. They shall receive their appointment by invitation of the meeting, after an introduction from any of its members present, or from any of the absent permanent members. They shall hold their connection with the Association until the close of the annual session at which they are received; and shall be entitled to participate in all its affairs, as in the case of delegates.

The Permanent Members shall consist of all those who have served in the capacity of delegates, and of such other members as may receive the appointment by unanimous vote.

Permanent members shall at all times be entitled to attend the meetings, and participate in the affairs of the Association, so long as they shall continue to conform to its regulations, but without the right of voting; and, when not in attendance, they shall be authorized to grant letters of introduction to reputable practitioners of medicine residing in their vicinity, who may wish to participate in the business of the meetings, as provided for members by invitation.

Every member elect, prior to the permanent organization of the annual meeting, or before voting on any question after the meeting has been organized, must sign these regulations, inscribing his name and address in full, specifying in what capacity he attends, and, if a delegate, the title of the institution from which he has received his appointment.

III. MEETINGS.

The regular meetings of the Association shall be held annually, and commence on the first Tuesday in May. The place of meeting shall never be the same for any two years in succession, and shall be determined for each next succeeding year by vote of the Association.

IV. OFFICERS.

The officers of the Association shall be a President, four Vice Presidents, two Secretaries, and a Treasurer. They shall be nom-

nated by a special committee of one member from each State represented at the meeting, and shall be elected by vote on a general ticket. Each officer shall hold his appointment for one year, and until another is elected to succeed him.

The President shall preside at the meetings, preserve order and decorum in debate, give a casting vote when necessary, and perform all the other duties that custom and parliamentary usage may require.

The Vice-Presidents, when called upon, shall assist the President in the performance of his duties, and, during the absence, or at the request of the President, one of them shall officiate in his place.

The Secretaries shall record the minutes, and authenticate the proceedings, give due notice of the time and place of each next ensuing annual meeting, and serve as members of the Committee of Publication. The Secretary first in nomination shall also preserve the archives and unpublished transactions of the Association.

The Treasurer shall have the immediate charge and management of the funds and property of the Association. He shall be a member of the Committee of Publication, to which committee he shall give bonds for the safe keeping, and proper use and disposal of his trust. And through the same committee he shall present his accounts, duly authenticated, at every regular meeting.

V. STANDING COMMITTEES.

The following standing committees, each composed of seven members, shall be organized at every annual meeting, for preparing, arranging, and expediting business for each next ensuing year, and for carrying into effect the orders of the Association not otherwise assigned—namely, a Committee of Arrangements and a Committee of Publication.

The Committee of Arrangements shall, if no sufficient reasons prevent, be mainly composed of members residing in the place at which the Association is to hold its next annual meeting; and shall be required to provide suitable accommodations for the meeting, to verify and report upon the credentials of membership, to receive and announce all essays and memoirs voluntarily communicated, either by members of the Association, or by others through them, and to determine the order in which such papers are to be read and considered.

The Committee of Publication, of which the Secretaries and Trea-

surer must constitute a part, shall have charge of preparing for the press, and of publishing and distributing such of the proceedings, transactions, and memoirs of the Association, as may be ordered to be published. The six members of this Committee, who have in the immediate management of the funds, shall also, in their own names, as agents for the Association, hold the bond of the Treasurer for the faithful execution of his office, and shall annually audit and authenticate his accounts, and present a statement of the same in the annual report of the Committee; which report shall specify the character and cost of the publications of the Association during the year, the number of copies still at the disposal of the meeting, the funds on hand for further operations, and the probable amount of the assessment to be laid on each member of the Association for covering its annual expenditures.

VI. FUNDS AND APPROPRIATIONS.

Funds shall be raised by the Association for meeting its current expenses and awards from year to year; but never with the view of creating a permanent income from investments. Funds may be obtained by an equal assessment of not more than three dollars annually, on each of the members; by individual voluntary contributions for specific objects; and by the sale and disposal of publications, or of works prepared for publication.

The funds may be appropriated for defraying the expenses of the annual meetings; for publishing the proceedings, memoirs, and transactions of the Association; for enabling the standing committees to fulfil their respective duties, conduct their correspondence, and procure the materials necessary for the completion of their stated annual reports; for the encouragement of scientific investigations, by prizes and awards of merit; and for defraying the expenses incidental to specific investigations under the instruction of the Association, where such investigations have been accompanied with an order on the Treasurer to supply the funds necessary for carrying them into effect.

VII. PROVISION FOR AMENDMENTS.

No amendment or alteration shall be made in any of these articles, except at the annual meeting next subsequent to that at which such amendment or alteration may have been proposed; and then

nly by the voice of three-fourths of all the members nce.

And, in acknowledgment of having adopted the fore ositions, and of our willingness to abide by them, ar ndeavors to carry into effect the objects of this Asso bove set forth—we have hereunto set our names.

NAMES OF MEMBERS.	RESIDENCE.	INSTITUTIONS REPRE

In connection with the foregoing "Plan of Organizat following was adopted as one of the ordinances, or by-la Association, viz:—

THE ORDER OF BUSINESS.

The order of business at the annual meetings of the A Medical Association shall at all times be subject to the three-fourths of all the members in attendance; and, until nently altered, except when for a time suspended, it sha follows, viz:—

1. The temporary organization of the meeting preparator election of officers.
2. The report of the Committee of Arrangements on the tials of members; after the latter have registered their na addresses, and the titles of the institutions which they repr
3. The calling of the roll.
4. The election of officers.
5. The reading of minutes.
6. The reception of members not present at the opening meeting, and the reading of notes from absentees.
7. The reception of members by invitation.
8. The reading and consideration of the stated annual from the standing committees.

9. The selection of the next place of annual meeting.

10. The new appointments to fill the standing committees.

11. The choice of permanent members by vote.

12. Resolutions introducing new business, and instructions to the permanent committees.

13. The reading and discussion of voluntary communications introduced through the Committee of Arrangements.

14. Unfinished and miscellaneous business.

15. Adjournment.

ORDINANCES.

The following *Resolutions*, adopted at different meetings of the Association, though not incorporated into the *Plan of Organization*, constitute a portion of the *Regulations* for the government of the Association.

RESOLUTIONS ADOPTED AT THE FOURTH ANNUAL MEETING, HELD IN CHARLESTON, IN 1851.

(See TRANSACTIONS, vol. iv.)

Resolved, That committees of three be appointed to investigate and report, severally, on the following subjects:—

1st. Causes of tubercular diathesis.

2d. Blending and conversion of the types of fever.

3d. The mutual relations of yellow fever and bilious remittent fever.

4th. Epidemic erysipelas.

5th. Acute and chronic diseases of the neck of the uterus.

6th. Dengue.

7th. The milk sickness so called.

8th. Endemic prevalence of tetanus.

9th. Diseases of parasitic origin.

10th. Physiological peculiarities and diseases of the Negro.

11th. The action of water on lead pipes, and the diseases which proceed from it.

12th. The alkaloids which may be substituted for quinia.

13th. Permanent cure of reducible hernia.

14th. Results of surgical operations for the relief of malignant diseases.

15th. Statistics of operations for removal of stone in the bladder.

16th. Cold water dressings.

17th. The sanitary principles applicable to the construction of dwellings.

18th. The toxicological and medicinal properties of our cryptogamic plants.

19th. Agency of the refrigeration produced through upward radiation of heat as an exciting cause of disease.

20th. Epidemic diseases of New England and New York.

21st. Epidemic diseases of Pennsylvania, New Jersey, Delaware, and Maryland.

22d. Epidemic diseases of Virginia and North Carolina.

23d. Epidemic diseases of South Carolina, Georgia, Florida, and Alabama.

24th. Epidemic diseases of Mississippi, Louisiana, Texas, and Arkansas.

25th. Epidemic diseases of Tennessee and Kentucky.

26th. Epidemic diseases of Missouri, Illinois, Iowa, and Wisconsin.

27th. Epidemic diseases of Indiana, Ohio, and Michigan.

Resolved, That a Committee on Nomination be appointed, whose duty it shall be to nominate one chairman for each of the above committees.

Resolved, That each of the chairmen thus nominated shall select, at his earliest convenience, two members of the Association, to complete the committee.

Resolved, That a committee of five members be appointed, to be called the Committee for Volunteer Communications,[1] whose duty it shall be, in the interval between the present and the next succeeding sessions, to receive papers upon any subject, from any persons who may choose to send them, to decide upon the merits of these papers, and to select for presentation to the Association, at its next session, such as they may deem worthy of being thus presented.

Resolved, That the Committee for Volunteer Communications shall have the power to form such regulations as to the mode in which the papers are to be presented, and as to the observing of secrecy, as they may think proper.

Resolved, That the selection of the members of this committee be referred to the same Nominating Committee, whose duty it will be to appoint the chairmen of the several special committees, as above directed, with this restriction, that the individuals composing it shall reside in the same neighborhood.

Resolved, That a prize of fifty dollars[2] be awarded to each of the

[1] The title of this Committee was changed by a resolution adopted at the Sixth Annual Meeting to that of "*Committee on Prize Essays.*" (See vol. vi. p. 47.)

[2] By a resolution adopted at the Fifth Annual Meeting, the number of prizes was reduced to *two*, and the amount of the prizes increased to *one hundred dollars*. (See vol. v. p. 45.)

volunteer communications reported on favorably by the Committee, and directed by the Association to be published, provided that the number to which the prize is thus awarded, do not exceed five;[1] and provided, also, if the number approved and directed to be published exceed five, that, in such case, the prize be awarded to the five which the Committee may determine to be most meritorious (pp. 36–38).

Resolved, That the Committee of Publication be instructed to print, conspicuously, at the beginning of the forthcoming volume of the *Transactions*, the following disclaimer, viz: The American Medical Association, although formally accepting and publishing the reports of the various standing committees, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when so decided by special resolution (p. 39).

RESOLUTIONS ADOPTED AT THE FIFTH ANNUAL MEETING, HELD IN RICHMOND, IN 1852.

(See TRANSACTIONS, vol. v.)

Resolved, That the special committees on Medical Education, and Medical Literature, be appointed, consisting each of five members, and that the Nominating Committee be instructed to nominate such committees to this Association (p. 32).

Resolved, That, instead of awarding five prizes of $50 each, anually, the Association hereafter grant two prizes of $100 each, for the two best essays (p. 45).

RESOLUTIONS ADOPTED AT THE SIXTH ANNUAL MEETING, HELD IN NEW YORK, IN 1853.

(See TRANSACTIONS, vol. vi.)

Resolved, That the Committee of Publication have power to furnish the chairmen of committees on epidemics with extra copies of their reports, respectively, at the expense of the Association—the said extra copies not to exceed one hundred (p. 28).

Resolved, That the name of the Committee on Volunteer Communications be changed to that of Committee on Prize Essays (p. 47).

[1] See note preceding page.

RESOLUTIONS ADOPTED AT THE SEVENTH MEETING, HELD IN ST. LOUIS.

(See TRANSACTIONS, vol. vii.)

Resolved, That the sum of three dollars, annually, be assessed upon each of the delegates to the sessions of the Association, as well as upon each of its permanent members, for the purpose of raising a fund to defray the expenses of printing the *Transactions*. The payment of this assessment shall be required of the delegates and members in attendance upon the sessions of the Association, previously to their taking their seats and participating in the business of the session; and of all others on or before the first of September in each year.

Resolved, That each delegate and member who has paid his annual assessment, in accordance with the terms of the above resolution, shall be entitled to receive a copy of the printed *Transactions* of the session.

Resolved, That the name of no one shall be inserted or continued on the list of permanent members of the Association who shall refuse or neglect to pay his annual assessment, in accordance with the terms of the first resolution, but it shall be the duty of the Treasurer, before erasing the name of any member, to issue a circular informing him of his indebtedness.

Resolved, That it shall be the duty of the Committee of Publication to fix the price at which the printed *Transactions* of each session will be furnished to others than delegates and members; provided, that in no case shall the said price be less than three dollars.

Resolved, That the delegates to the Association be requested to appoint committees, at one or more central points within their respective States, for the purpose of aiding the Committee of Publication in procuring subscribers, and in distributing the printed volumes of *Transactions* to said subscribers, as well as to the members of the Association residing within the neighborhood of the said committees, respectively (p. 22).

Resolved, That a standing committee be appointed by this Association to procure memorials of the eminent and worthy dead among the distinguished physicians of our country, and present them to this Association for publication in their *Transactions* (p. 30).

Resolved, That a standing committee of ——— members be appointed by this Association, on the subject of Insanity, as it pre-

ails in this country, including its causation—as hereditary transmission; educational influences—physical and moral, social and political institutions, &c.; its forms and complications; curability; means of prevention, &c. (p. 32).

Resolved, That it shall be the duty of the Publication Committee to append to each volume of the *Transactions*, hereafter published, a copy of the Constitution of the Association (p. 34).

Resolved, That, hereafter, every paper received by this Association and ordered to be published, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published and sold for the exclusive benefit of the Association (p. 40).

Resolved, That, hereafter, the majority of the Committee of Publication shall be selected from the physicians of that city in which this Association may hold its annual session (p. 41).

Resolved, That it is the duty of every member of this Association, who learns that any existing medical school departs from the published conditions of graduation, to report the fact at the annual meetings; and that, on proof of the fact, such school shall be deprived of its representation in this body (p. 43).

RESOLUTIONS ADOPTED AT THE EIGHTH MEETING, HELD IN PHILADELPHIA, 1855.

(See TRANSACTIONS, vol. viii.)

Resolved, That no permanent member who is not present at a meeting of the Association, shall be required to pay the annual assessment; but no such permanent member shall be entitled to receive a copy of the printed *Transactions* unless he pay into the treasury a sum not less than the annual assessment paid by the delegates and permanent members in attendance; and that all the names of permanent members that have been left off the published list, be reinserted therein in the next volume of *Transactions*.

Resolved, That no assessment whatever shall be made against members by invitation, but that they also shall be entitled to a copy of the printed *Transactions*, by paying the sum assessed upon delegates in attendance (p. 29).

Resolved, That hereafter, beginning with the session for 1856, no report or other paper shall be entitled to publication in the volume for the year in which it shall be presented to the Association,

unless it be placed in the hands of the Committee of Publication on or before the first of June (p. 36).

Resolved, That this Association appoint a special committee for each State and Territory represented, of —— members, whose duty it shall be to report upon its medical topography, epidemic diseases, and the most successful treatment thereof, and that the same shall continue to hold their office for three years.

Resolved, That, as other States and Territories, not now represented, become so by delegates duly appointed to this National Association, similar committees shall be appointed for like purposes, and that they also shall hold their office for three years.

Resolved, That in the appointment of gentlemen of education and experience in the affairs of their own State, we have the best guarantee that the important objects we seek will be more satisfactorily accomplished, and the profession as well as the public interest thereby better served.

Resolved, That the committees heretofore appointed by this Association, at its session in Charleston, for a similar object, be and the same are hereby discharged.

Resolved, That no State or local society shall hereafter be entitled to representation in this Association, that has not adopted its Code of Ethics.

Resolved, That no State or local society that has intentionally violated or disregarded any article or clause in the Code of Ethics shall any longer be entitled to representation in this body (p. 56).

Resolved, That no organization or institution, entitled to representation in this Association, shall be considered in good standing which has not adopted its Code of Ethics (p. 60).

RESOLUTIONS ADOPTED AT THE NINTH MEETING, HELD IN DETROIT, 1856.

(See TRANSACTIONS, vol. ix.)

Resolved, That the resolutions adopted by the Association at its session in St. Louis, in 1854, requiring the Committee of Publication to be selected from the place where the meeting should be held, be repealed (p. 24).

Resolved, That no one be permitted to address the Association, except he shall have first given his name and residence, which shall be distinctly announced from the Chair, and the member be required

to go forward and speak from the stand, and not more than ten minutes at one time (p. 24).

Resolved, That the President shall be authorized annually to appoint delegates to represent this Association at the meetings of the British Association, the American Medical Society at Paris, and such other scientific bodies in Europe as may be affiliated with us (p. 30).

Resolved, That all voluntary communications hereafter presented to the Association, shall be referred to a special committee of ——, to be appointed by the President on the first day of each annual meeting, whose duty it shall be to examine such communications, and report upon the propriety of the presentation and reference to the Committee of Publication (p. 40).

Resolved, That any new Medical Institution not heretofore represented in this body, be required to transmit to the Secretary, with the credentials of its delegates, evidence of its existence, capacity, and good standing (p. 42).

Resolved, That, hereafter, an annual prize of ———— dollars be awarded for the best memoir or essay founded on original investigations of the author, and, in case of no memoir or essay being presented worthy of such award, the prize money to be appropriated towards the expenses of publishing and illustrating such memoirs or essays as may be subsequently deemed worthy of an award.

OFFICERS

AND

PERMANENT MEMBERS.

CATALOGUE

OF THE

OFFICERS AND PERMANENT MEMBERS

OF THE

AMERICAN MEDICAL ASSOCIATION.

OFFICERS FOR 1856–57.

PRESIDENT.

ZINA PITCHER, *Michigan.*

VICE-PRESIDENTS.

THOS. W. BLATCHFORD, *New York.*
WM. K. BOWLING, *Tennessee.*
E. GEDDINGS, *South Carolina.*
WM. H. BRISBANE, *Wisconsin.*

SECRETARIES.

WM. BRODIE, *Michigan.*
R. C. FOSTER, *Tennessee.*

TREASURER.

CASPAR WISTER, *Pennsylvania.*

PERMANENT MEMBERS.

Those who have an obelisk [†] prefixed to their names are dead.

MAINE.

Allen, W. H.	*Orono.*
Bartlett, Ezra	*South Berwick.*
Boutelle, N. B.	*Waterville.*
Chase, Sumner B.	*Portland.*
Dickinson, J. P.	*Bangor.*
Emerson, N.	*Orland.*
Fessenden, C. S. D.	*Portland.*
Fuller, A. J.	*Bath.*
Garcelon, Alonzo	*Lewiston.*
Lincoln, Isaac	*New Brunswick.*
McAlister, Asa	*Ellsworth.*
McKeen, James	*Topsham.*
McRuer, D.	*Bangor.*
Millet, Charles	*Lewiston, Androscoggin Co.*
Monroe, Hollis	*Belfast.*
Monroe, N. P.	*do.*
Oakes, Sylvester	*Auburn.*
Page, A. F.	*Hancock.*
Page, H. N.	*Penobscot.*
Palmer, G. S.	*Gardner.*
Stockbridge, T. G.	*Bath.*
Swan, Chas. E.	*Calais.*
Weston, J. C.	*Bangor.*

NEW HAMPSHIRE.

Abbott, James B.	*Sanbornton.*
†Bartlett, Josiah	*Stratham.*
Batchelder, Daniel H.	*Londonderry.*
Batcheller, James	*Marlborough.*
Boyden, F.	*Hinsdale.*
Brown, Thomas	*Manchester.*
Buck, W. D.	*do.*
Carr, Alonzo F.	*Goffstown.*

Carr, John	*Sanbornton.*
Carter, Ezra	*Concord.*
Crosby, Dixi	*Hanover.*
Crosby, Josiah	*Manchester.*
Crosby, T. R.	*do.*
Cummings, Silas	*Fitzwilliam.*
Currie, T. H.	*Boscawen.*
Danforth, James	*New Boston.*
Dickey, Abraham O.	*Lyme.*
Eastman, Josiah C.	*Hamstead.*
Eaton, Harrison	*Merrimack.*
Fernald, John S.	*Barrington.*
Fitch, Francis P.	*Amherst.*
French, John O.	*Chesterfield,*
Gage, Charles P.	*Concord.*
Garland, G. W.	*Meredith Bridge.*
Graves, Josiah G.	*Nashville.*
Hamilton, Cyrus B.	*Lyme.*
Haynes, Timothy	*Concord.*
Hill, Levi G.	*Dover.*
Hoyt, Enos	*Framingham.*
Kelley, S. B,	*Franklin.*
Marshall, Thomas H.	*Mason Village.*
Martin, Noah	*Dover.*
Miller, Luke	*Fitzwilliam.*
Parker, D. T.	*Farmington.*
Pearce, H.	*Winchester.*
Peaslee, Edmund R.	*Hanover.*
Prescott, William	*Concord.*
Sanborn, Nathan	*Henniker.*
Sargent, J. F.	*Concord.*
Savory, Charles A.	*Hopkinton.*
Smalley, Adoniram	*Lyme, Grafton Co.*
Smith, Albert	*Peterborough.*
Smith, Joseph H.	*Dover.*
Spaulding, Edward	*Nashua.*
Stackpole, P. A.	*Dover.*
Stone, W. P.	*Danbury.*
†Twitchell, Amos	*Keene.*
Twitchell, George B.	*do.*
Webster, E. R.	*Boscawen.*
Woodbury, Peter P.	*Bedford.*

VERMONT.

Allen, C. L.	*Middlebury.*
Babcock, M. N.	*Fairfield.*
Bancroft, J. P.	*St. Johnsbury.*
Bass, Zacheus	*Middlebury.*
Brown, H. B.	*Hartford.*
Burnham, Z. P.	*Montpelier.*
Carpenter, W.	*East Randolph.*
Carr, Ezra T.	*Castleton.*
Chandler, Charles B.	*Tunbridge.*
Clark, C.	*Montpelier.*
Cleaveland, Charles H.	*Castleton.*
Converse, Shubael	*Norwich.*
Cushman, Earl	*Orwell.*
Dana, A. G.	*Brandon.*
Drew, O. W.	*Waterbury.*
†Hall, Charles	*Burlington.*
Hatch, Horace	*do.*
Higginson, Francis J.	*Brattleboro'.*
Hinckley, I.	*Thetford.*
Jewett, Calvin	*St. Johnsbury.*
Morse, James R.	*Chelsea.*
Newell, Selim	*Lyndon.*
Niles, H. H.	*Thetford.*
Perkins, Joseph	*Castleton.*
Phelps, Edward E.	*Windsor.*
Pitkin, A. S.	*Burlington.*
Pittman, N. J.	*Brattleboro'.*
Ranney, W. R.	*Townshend.*
Rockwell, W. H.	*Brattleboro'.*
Smith, Orrin	*Montpelier.*
Spalding, James	*do.*
Stiles, J. N.	*Strafford.*
Story, Dyer	*West Windsor.*
Washburn, Cyrus	*Vernon.*
Woodward, A. J.	*Castleton.*
Worcester, E. C.	*Thetford.*

MASSACHUSETTS.

Abbott, Samuel L.	*Boston.*
Adams, Horace W.	*do.*
Adams, Horatio	*Waltham.*
Adams, Nathan	*Springfield.*
Adams, Z. Boylston	*Boston.*
Agassiz, Louis	*Cambridge.*
Ainsworth, F. S.	*Boston.*
Alden, Ebenezer	*Randolph.*
Allen, Nathan	*Lowell.*
Alley, J. B.	*Boston.*
Bacon, jr., John	*do.*
Bancroft, Amos B.	*Groton.*
Bartlett, George	*Boston.*
Bartlett, Josiah	*Concord.*
Bartlett, Lyman	*New Bedford.*
†Batcheller, Stephen	*Royalston.*
Bates, Joseph N.	*Barre.*
Bell, Luther V.	*Somerville.*
Bemis, David	*Chickopee.*
Bemis, Jonathan W.	*Charlestown.*
Bethune, George A.	*Boston.*
Bigelow, Henry J.	*do.*
Bigelow, Jacob	*do.*
Blake, E. W.	*do.*
Blake, Jeremiah	*Lowell.*
Blake, J. E.	*Boston.*
Borland, J. Nelson	*do.*
Boutelle, Thomas R.	*Fitchburgh.*
Bowditch, Henry J.	*Boston.*
Bridgeman, William	*Springfield.*
Brown, Buckminster	*Boston.*
Brown, Jonathan	*Tewksbury.*
Buck, Ephraim	*Boston.*
Buckingham, Charles E.	*do.*
Burnap, S. G.	*Holliston.*
Cabot, jr., Samuel	*Boston.*
Carpenter, E. W.	*Chatham.*
Carpenter, Nelson	*Warren.*
Channing, Walter	*Boston.*

Chapman, T. L.	*Long Meadow.*
Chase, Charles	*Chelsea.*
Childs, H. H.	*Pittsfield.*
Choate, George	*Salem.*
Clark, Edward H.	*Boston.*
Clark, Henry G.	*do.*
Clarke, Moses	*East Cambridge.*
Coale, William E.	*Boston.*
Cogswell, George	*Bradford.*
Collins, Clarkson T.	*Great Barrington, Berkshire Co.*
Comstock, W. W.	*Wrentham.*
Cornell, W. M.	*Boston.*
Cornish, Aaron	*Falmouth.*
Cotting, B. E.	*Roxbury.*
Cox, jr., Benj.	*Salem.*
Crane, Phineas M.	*East Boston.*
Curtis, Josiah	*Lowell.*
Cutter, Benjamin	*Woburn.*
Cutter, Nehemiah	*Pepperell.*
Dale, William J.	*Boston.*
Dalton, John C.	*Lowell.*
Davis, R. T.	*Fall River.*
Dearborne, A. D.	*Upper Falls, Newton.*
Dickey, Hanover	*Lowell.*
Dix, John H.	*Boston.*
Eames, Ambrose N.	*Wrentham.*
Eastman, E. T.	*Boston.*
Ellis, Calvin	*do.*
Farnum, jr., J.	*Salem.*
Fay, Allen C.	*Milford.*
Fay, Chas.	*Charlton.*
Fearing, Elisha P.	*Nantucket.*
Fisk, Samuel A.	*Northampton.*
Fisk, Calvin P.	*Fiskdale.*
Flint, Edward	*Leicester, Worcester Co.*
Flint, John	*Boston.*
Folsom, Levi	*New Bedford.*
Forsyth, James B.	*Chelsea.*
Gay, George H.	*Boston.*
Gillman, B. F.	*Nantucket.*
Gordon, Charles	*Boston.*

Gordon, Timothy	*Plymouth.*
Gould, Augustus A.	*Boston.*
Graves, John W.	*Lowell.*
Green, John	*Worcester.*
Green, John O.	*Lowell.*
Guiteau, Coridon	*Lee.*
†Hale, Enoch	*Boston.*
Harpur, John	*Sandwich.*
Haskell, Benjamin	*Rockport.*
Hayden, Jno. C.	*Boston.*
Hayward, George	*do.*
Hayward, jr., George	*do.*
Heywood, B. F.	*Worcester, Worcester Co.*
Hitchcock, Alfred	*Fitchburgh, Worcester Co.*
Holmes, Christopher C.	*Milton, Norfolk Co.*
Holmes, Oliver W.	*Boston.*
Homans, John	*do.*
Homans, C. D.	*do.*
Hooker, Anson	*Cambridge.*
Hooker, Anson P.	*do.*
Hooper, Foster	*Fall River.*
Hooper, R. W.	*Boston.*
Hoovey, Daniel	*Greenfield, Franklin Co.*
Hosmer, Hiram	*Watertown.*
Howe, Zadoc	*Billerica.*
Howe, Appleton	*South Weymouth, Norfolk Co.*
Huntingdon, Elisha	*Lowell.*
Huse, Stephen	*Methuen.*
Inches, H. B.	*Boston.*
Jackson, James	*do.*
Jackson, Charles J.	*do.*
Jackson, J. B. S.	*do.*
Jackson, Woburn	*do.*
Jarvis, Edward	*Dorchester.*
Jeffries, John	*Boston.*
Jennings, Selden	*Richmond.*
Keep, N. C.	*Boston.*
Kimball, Gilman	*Lowell.*
Kittridge, Theodore	*Waltham.*
Lambert, Alfred	*Springfield.*
Lamb, W. D.	*Lawrence.*

Leland, F.	*Milford.*
Leonard, Jonathan	*Sandwich.*
Leonard, M. B.	*East Boston.*
Lewis, Winslow	*Boston.*
Lovell, Ephraim W.	*Boylston.*
Lyman, George H.	*Boston.*
Mack, William	*Salem.*
Mackie, Andrew	*New Bedford.*
Martin, Oramel	*Worcester.*
Metcalf, John George	*Mendon.*
Miller, E. D.	*Dorchester.*
Minot, Francis	*Boston.*
Monroe, A. LeB.	*Medway.*
Moore, E. B.	*Boston.*
Morland, William W.	*do.*
Morrill, Samuel	*do.*
Mowe, Daniel	*Lowell.*
Noyes, Josiah	*Needham P. O.*
Odin, jr., John	*Boston.*
Page, W. H.	*do.*
Palmer, E. D. G.	*do.*
†Parkman, George	*do.*
Parkman, Samuel	*do.*
Parks, jr., Luther	*do.*
Peck, Wm. D.	*Sterling.*
†Pierson, A. L.	*Salem.*
Pierson, E. B.	*do.*
Perkins, Henry C.	*Newburyport.*
Perkins, John P.	*Great Barrington.*
Perry, M. S.	*Boston.*
Pierce, John	*Edgartown.*
Pilsbury, John D.	*Lowell.*
Pond, Benjamin	*Westborough.*
Poole, Alexander	*Dennis.*
Pratt, Jefferson	*Kopkington.*
Reynolds, Edward	*Boston.*
Reynolds, Joseph	*Gloucester.*
Richardson, Horace	*Boston.*
Robbins, James W.	*Uxbridge.*
Rook, O. S.	*Pittsfield.*
Root, Martin	*Byfield.*

Russell, Le Baron	*Boston.*
Salisbury, Stephen	*Brookline.*
Sargent, J.	*Worcester.*
Sargent, H.	*do.*
Savory, Charles A.	*Lowell.*
Shattuck, jr., George C.	*Boston.*
Shurtleff, Augustine	*Brookline.*
Shurtleff, Nathaniel B.	*Boston.*
†Smith, James M.	*Springfield.*
Smith, J. V. C.	*Boston.*
Snow, A. B.	*do.*
Spaulding, Miles	*Dunstable.*
Spooner, John P.	*Dorchester.*
Spooner, Paul	*New Bedford.*
Sprague, Seth L.	*Boston.*
Stedman, Charles H.	*do.*
Stimson, Jeremy	*Dedham.*
Stevens, William F.	*Stoneham.*
Stone, James W.	*Boston.*
Stone, Joseph	*Hardwick.*
Stone, Henry O.	*Boston.*
Storer, D. Humphreys	*do.*
Storer, H. R.	*do.*
Taylor, A. H.	*Shelburne Falls.*
Taylor, jr., Nathaniel W.	*Springfield.*
Thayer, W. Henry	*Boston.*
Thomas, A.	*Cambridge.*
Thomas, A. T.	*Boston.*
Thompson, James	*Northampton.*
Townsend, S. D.	*Boston.*
Wales, Bradford L.	*Randolph.*
Ware, Charles E.	*Boston.*
Ware, John	*do.*
Ware, Jonathan	*Milton.*
Warren, John C.	*Boston.*
Warren, J. Mason	*do.*
Warren, jr., J. W.	*do.*
Wellington, T.	*West Cambridge.*
Wheeler, W. G.	*Chelsea.*
White, Vassel	*Curtisville P. O., Stockbridge, Berkshire Co.*

Whitney, Simon	*Framingham.*
Whitridge, W. C.	*New Bedford.*
Wilder, Charles W.	*Leominster.*
Wiley, Adams	*Roxbury.*
Willard, H.	*Boston.*
Williams, Stephen W.	*Deerfield.*
Woorland, William W.	*Boston.*
Workman, William	*Worcester, Worcester Co.*
York, Jasper H.	*Boston.*

RHODE ISLAND.

Allen, Hiram	*Woonsocket.*
Arnold, S. Augustus	*Providence.*
Ballou, A. W.	*do.*
Boker, Geo. P.	*do.*
Brown, W. O.	*do.*
Brownell, Richmond	*do.*
Capron, George	*do.*
Clapp, Sylvanus	*Pawtucket.*
Cleveland, H.	*New Providence.*
Clifford, Lewis W.	*Providence.*
Collins, George L.	*do.*
Dunn, Theophilus C.	*Newport.*
Eldridge, J. H.	*East Greenwich.*
Ely, James W. C.	*Providence.*
Fowler, Ezekiel	*Woonsocket Falls*
King, David	*Newport.*
Le Prohon, E. P.	*Providence.*
Mauran, Joseph	*do.*
Miller, Lewis L.	*do.*
Parsons, Charles W.	*do.*
Parsons, Usher	*do.*
Pratt, H. P.	*do.*
Rivers, H. W.	*do.*
Snow, Ed. M.	*do.*
Warren, J. E.	*Cumberland.*

CONNECTICUT.

Barrows, Ashbel W.	*Hartford.*
†Beach, Samuel	*Bridgeport.*
Beardsley, Lucian N.	*Milford.*

Beardsley, Sheldon	*North Branford.*
Beckwith, Josiah G.	*Litchfield.*
Bennett, Hanford N.	*Bridgeport.*
Beresford, S. B.	*Hartford.*
Bishop, E. H.	*New Haven.*
†Bowen, Samuel	*Thompson.*
Bradford, Milton	*West Woodstock.*
Brigham, Norman	*North Mansfield.*
Bronson, Henry	*New Haven.*
Brownell, Clarence M.	*East Hartford.*
Budington, George E.	*New Haven.*
Burke, George W.	*Middletown.*
Burr, David S.	*Westport.*
Campbell, Harvey	*Voluntown.*
Canfield, Joel	*Guilford.*
†Carrington, Edwin W.	*Farmington.*
Casey, William B.	*Middletown.*
Castle, Andrew	*Woodbridge.*
Catlin, Benjamin H.	*West Meriden.*
Catlin, Samuel	*Watertown.*
Comings, B. N.	*New Britain.*
Deming, Ralph	*Sharon.*
Dickinson, Francis L.	*Willington.*
Downes, John K.	*New Haven.*
Downing, Eleazer B.	*Preston.*
Ford, John D.	*Norwich.*
Fowler, Remus M.	*Washington.*
Francis, D. P.	*New London.*
Haile, Ashbel B.	*Norwich.*
Hall, Eli	*East Hartford.*
Hammond, Justin	*Daysville.*
Harrison, David	*Middletown.*
†Hatch, Johnson C.	*Kent.*
Hawley, Roswell	*West Meriden.*
Hooker, Charles	*New Haven.*
Hooker, Worthington	*do.*
Hubbard, Denison H.	*Clinton.*
Hubbard, Robert	*Bridgeport.*
Hubbard, Stephen G.	*New Haven.*
Hutchins, Samuel	*West Killingly.*
Hutchinson, Ira	*Cromwell.*

Huxley, A. M.	*Goshen.*
Ives, Eli	*New Haven.*
Ives, Nathan B.	*do.*
Jarvis, George O.	*Portland.*
Jewett, Pliny A.	*New Haven.*
Knight, Jonathan	*do.*
Lindsley, Charles A.	*do.*
†Lyman, Norman	*Warren.*
Matthews, H. W. E.	*New Haven.*
Middlebrook, Elijah	*Trumbull.*
Nicall, John	*New Haven.*
North, B. B.	*Cornwall.*
Noyes, Samuel S.	*New Canaan.*
Nye, Elisha B.	*Middletown.*
Peters, Manly	*Woodville.*
Pierson, William S.	*Windsor.*
Pike, Nathan S.	*Sterling Hill.*
Platt, Gideon L.	*Waterbury.*
Rockwell, P. G.	*do.*
Rogers, Benjamin	*Hartford.*
Russell, Gurdon W.	*do.*
Salisbury, Samuel T.	*Plymouth.*
Sanford, Leonard J.	*New Haven.*
Silliman, jr., Benjamin	*do.*
Skinner, Alden	*Rockville.*
St. John, Gamaliel H.	*Merwinsville.*
†Sumner, George	*Hartford.*
Talcott, Alvan	*Guilford.*
Totten, J. H.	*New Haven.*
Totten, Thomas H.	*do.*
†Warner, Richard	*Cromwell.*
Webb, Reynold	*Madison.*
†Welch, Archibald	*Hartford.*
Welch, Benjamin	*Lakeville.*
Welch, James	*Winstead.*
Welch, William W.	*Norfolk.*
White, Roderick A.	*Simsbury.*
Williams, Lewis	*Pomfret.*
Wilson, Myron W.	*Hartford.*
†Witter, William	*Willimantic,*
Wood, William	*East Windsor Hill.*

Woodruff, William	*Plymouth.*
Woodward, Ashbel	*Franklin.*
Wright, Albert A.	*Canaan.*

NEW YORK.

Adams, John G.	*New York.*
Allen, R. L.	*Saratoga Springs.*
Allen, Lucius H.	*Owego, Tioga Co.*
Anderson, James	*New York.*
Anderson, W. E.	*Stapleton.*
Armsby, James H.	*Albany.*
Armstrong, E. W.	*Rochester.*
Atwater, D. F.	*Brooklyn.*
Austin, James M.	*Waterford.*
Ayres, Daniel	*Brooklyn.*
Ayres, Daniel	*Amsterdam.*
Babcock, Charles	*New Hartford, Oneida Co.*
Babcock, M. N.	*Saratoga Springs.*
Bacon, C. G.	*Fulton.*
Baker, jr., A.	*Norwich.*
Barker, B. Fordyce	*New York.*
Barrett, S.	*Le Roy.*
Batchelder, J. P.	*New York.*
Bauer, Louis	*Brooklyn.*
Bay, William	*Albany.*
Baxter, Hiram	*Stillwater, Saratoga Co.*
Beadle, E. L.	*New York.*
Beck, T. Romeyn	*Albany.*
Beebe, Seneca	*McDonough, Chenango Co.*
Bissell, H. P.	*Utica.*
Blakeman, William N.	*New York.*
Blatchford, Thomas W.	*Troy.*
Bolton, Jackson	*New York.*
Borrowe, J. H.	*do.*
Bradford, George W.	*Homer, Cortland Co.*
Brady, John A.	*New York.*
Briggs, W. H.	*Rochester.*
Brinsmade, Thomas C.	*Troy.*
Brooks, P. B.	*Binghampton, Broome Co.*
Brown, H. W.	*New York.*

Buck, Gurdon	*New York.*
Budd, A. E.	*Medford, Burlington Co.*
Budlong, Caleb	*Frankford, Herkimer Co.*
Buel, William P.	*New York.*
Bulkley, Henry D.	*do.*
Burton, C. V. W.	*Lansingburgh.*
Burwell, Bryant	*Buffalo.*
Burwell, George N.	*do.*
Calkins, Alonzo	*New York.*
Cammann, G. P.	*do.*
Carr, Edson	*Canandaigua, Ontario Co.*
Cary, Walter	*Buffalo.*
Carter, Galen	*New York.*
Cash, M. H.	*Ridgebury, Orange Co.*
Chamberlayne, J. K.	*Cazenovia.*
Chubbuck, H. S.	*Elmira, Chenango Co.*
Church, W. Henry	*New York.*
Clark, Alonzo	*do.*
Clements, James W. G.	*do.*
Clymer, Meredith	*do.*
Coates, L. B.	*Batavia.*
Cobb, J. V.	*Rome.*
Cock, Thomas	*New York.*
Cock, Thomas F.	*do.*
Cockcroft, James	*do.*
Coe, A. B.	*Oswego.*
Conant, D. S.	*New York.*
Congar, Horace M.	*Buffalo.*
Cook, Simeon A.	*Buskerk's Bridge.*
Corliss, Hiram	*Greenwich, Washington Co.*
Corson, J. W.	*New York.*
Corson, J.	*do.*
Cotes, L. B.	*Batavia.*
Coventry, C. B.	*Utica.*
Crandall, R. O.	*Waverley.*
Dalton, J. C.	*New York.*
Daniels, E.	*Union, Broome Co.*
Davis, E. H.	*New York.*
Dean, H. W.	*Rochester.*
Deming, J. P. H.	*Palmyra.*
Dering, Nicoll H.	*Utica.*

Donoughue, E. O.	*Bergen, Genesee Co.*
Doolittle, A. F.	*Herkimer.*
Douglas, J. Hancock	*New York.*
Downs, Henry S.	*do.*
Draper, John W.	*do.*
Dubois, Abram	*do.*
Dwight, W. C.	*Moscow, Livingston Co.*
Earle, Pliny	*New York.*
Eastman, M. H.	*Owego.*
Eliott, jr., Geo. T.	*New York.*
Ely, W. W.	*Rochester.*
Emmet, Thomas Addis	*New York.*
Enos, D. C.	*Brooklyn.*
Finnell, T. C.	*New York.*
Flint, Austin	*do.*
Ford, Corydon L.	*Lockport.*
Foster, Joel	*New York.*
Foster, S. Conant	*do.*
Francis, John W.	*do.*
French, S. H.	*Lisle, Broome Co.*
Gardner, Augustus K.	*New York.*
Garrish, J. P.	*do.*
Gilman, Chandler R.	*do.*
Glück, Isidore	*do.*
Goodsell, Thomas	*Utica.*
Gray, Henry G.	*North White Creek.*
Green, David	*New York.*
Green, J. W.	*do.*
Greene, Caleb	*Homer, Cortland Co.*
†Greene, Isaac	*New York.*
Green, Horace	*do.*
Goodyear, Miles	*Cortland.*
Griscom, John H.	*New York.*
Guthrie, C. B.	*do.*
Hadley, George	*Buffalo.*
Halsted, T. M.	*New York.*
Hamilton, Frank H.	*Buffalo.*
Harvey, Charles W.	*do.*
Hard, P. H.	*Oswego.*
Hart, John	*New York.*
Hart, Samuel	*Brooklyn.*

Hawley, Joel E.	*Ithaca.*
Henschell, C.	*New York.*
Hubbard, Samuel T.	*do.*
Hubbard, Silas	*Buffalo.*
Hun, Thomas	*Albany.*
Hunt, Sanford B.	*Buffalo.*
Husted, N. C.	*New York.*
Hutchison, J. C.	*Brooklyn.*
Hyde, Frederick	*Cortlandville.*
Hyde, Lucius	*Brooklyn.*
Ingraham, T. M.	*Flatbush.*
Jackson, Thomas	*Binghampton.*
Jackson, William H.	*New York.*
Jacobs, Ferris	*Delhi, Delaware Co.*
Jenkins, J. Foster	*Yonkers.*
Jerome, James H.	*Trumansburg.*
Jewett, C.	*Buffalo.*
Jewett, Harvey	*Canandaigua.*
Jones, Daniel S.	*Baldwinsville.*
Keene, Stephen S.	*New York.*
Kissam, K. S.	*do.*
Krackowitzer, E.	*Brooklyn.*
Lee, Charles A.	*New York.*
Linsly, Jared	*do.*
Little, G. S.	*Kirkwood.*
MacFarlan, Ebenezer	*Williamsburg, Long Island.*
†Manley, James R.	*New York.*
March, Alden	*Albany.*
Markoe, T. M.	*New York.*
McCall, John	*Utica.*
McIntyre, A.	*Wayne Co.*
McIntyre, A.	*Palmyra.*
McKay, Lawrence	*Rochester.*
McNaughton, James	*Albany.*
†McNevin, William H.	*New York.*
McNulty, John	*do.*
McPhail, L. C.	*Brooklyn.*
Metcalfe, John T.	*New York.*
Miller, John	*do.*
Miner, William	*do.*
Miner, J. M.	*Brooklyn.*

Mitchell, Henry	*Norwich.*
Mixer, S. F.	*Buffalo.*
Morrell, J. A.	*New York.*
Morris, Philip V. N.	*Buskirk Bridge.*
Morris, R. L.	*New York.*
Mott, Valentine	*do.*
Mott, Walter	*Schuylerville, Saratoga Co.*
Moulton, Peter	*New Rochelle, Westchester Co.*
Newman, Jas. M.	*Buffalo.*
Ogden, Benjamin	*New York.*
Orton, J. G.	*Binghampton.*
Parker, Willard	*New York.*
Parker, Edward H.	*do.*
Parkhurst, W. H. H.	*Frankfort.*
Parmly, Eleazer	*New York.*
†Pattison, Granville S.	*do.*
Peters, George A.	*do.*
Phelps, James L.	*do.*
Phillips, S. B.	*do.*
Pierce, J. B.	*Lyons.*
Pomeroy, Charles G.	*Newark, Wayne Co.*
Pond, James O.	*New York.*
Pope, H. H.	*Rome.*
Post, Alfred C.	*New York.*
Potter, U.	*Minden, Montgomery Co.*
Punnett, John	*New York.*
Purdy, J.	*Elmira, Chemung Co.*
Purdy, Samuel A.	*New York.*
Purple, S. S.	*do.*
Raymond, Charles H.	*do.*
Reese, D. Meredith	*do.*
Reid, Jno.	*Rochester.*
Reynolds, Tabor B.	*Wilton, Saratoga Co.*
Reynolds, J. H.	*do.*
Rockwell, Wm.	*New York.*
†Rodgers, J. Kearny	*do.*
Russ, J. D.	*do.*
Saunders, A. L.	*Brookfield, Madison Co.*
Sayre, Lewis A.	*New York.*
Schilling, E.	*do.*
Shanks, John	*do.*

Shelton, John D.	*Jamaica.*
Shipman, Azariah B.	*Syracuse.*
Skilton, Avery J.	*Troy.*
Smith, Albert	*New Rochelle.*
Smith, Charles D.	*New York.*
Smith, Joseph M.	*do.*
Smith, Stephen	*do.*
Snow, Simeon	*Root, Montgomery Co.*
Snyder, Morgan	*Fort Plain.*
Sprague, J. S.	*Exeter, Otsego Co.*
†Stearns, John	*New York.*
Stephenson, Mark	*do.*
Stevens, Alexander H.	*do.*
Stewart, F. Campbell	*do.*
Stewart, James	*do.*
Stewart, Philanda	*Peekskill.*
Stout, Arthur B.	*New York.*
Swaine, Chas. H.	*Cortlandville.*
Swett, John A.	*New York.*
Taft, Marcus L.	*do.*
Taylor, Isaac E.	*do.*
Taylor, Wm.	*Manlius.*
Tefft, Lake J.	*Onondaga.*
Tellkampf, Theo. A.	*New York.*
Thomas, Daniel	*Utica.*
Thompson, jr., A. G.	*New York.*
Thompson, A. H.	*Walden.*
Thompson, Alexander	*Aurora, Cayuga Co.*
Thorn, James	*Troy.*
Trask, J. D.	*White Plains.*
Trenor, Jno.	*New York.*
Turner, Thomas	*Flatbush.*
Van Buren, W. H.	*New York.*
Van Buren, Peter	*Albany.*
Vanderpool, S. O.	*do.*
Van Kleek, John R.	*New York.*
Van Pelt, M. D.	*do.*
Van Rensselaer, Alexander	*do.*
Wade, T. A.	*Brooklyn.*
Warner, E. B.	*New York.*
Warren, James	*do.*

Watson, John	*New York.*
Watts, Robert	*do.*
Weber, G.	*do.*
Weeks, Cyrus	*do.*
West, H. S.	*Binghampton, Broome Co.*
Wheeler, Lewis C.	*Troy.*
White, Devillo	*Sherburne, Chenango Co.*
White, James P.	*Buffalo.*
White, Oliver	*New York.*
White, S. P.	*do.*
Willard, Augustus	*Green, Chenango Co.*
Wilcox, Charles H.	*Buffalo.*
Winton, Nelson	*Havana, Chemung Co.*
Wing, Joel A.	*Albany.*
Wood, Isaac	*New York.*
Wood, James R.	*do.*
Woodward, G. F.	*do.*
Wooster, Joseph	*do.*
Wotkyns, Alfred	*Troy.*

NEW JERSEY.

Bateman, B. Rush	*Cedarville.*
Blane, J.	*Perryville.*
Brakeley, P. F.	*Belvidere, Warren Co.*
Butcher, Charles	*Maurice Town, Cumberland Co.*
Butler, S. W.	*Burlington.*
Canfield, J. W.	*Morristown.*
Chetwood, G. R.	*Elizabethtown.*
Clark, C. F.	*Woodbury.*
Clarke, J. Henry	*Newark.*
†Cole, N. W.	*Burlington.*
Coleman, J. B.	*Trenton.*
Coleman, J. P.	*Pemberton.*
Condict, Lewis	*Morristown.*
Cook, Chas.	*Jersey City.*
Cooper, Richard M.	*Camden.*
Corson, T. J.	*Trenton.*
Craig, J. W.	*Plainfield.*
Cullen, Thomas F.	*Camden.*
Dougherty, Alexander N.	*Newark.*
Elmer, William	*Bridgetown.*

Fithian, Enoch	*Greenwich.*
Fithian, Joseph	*Woodbury.*
Garrison, Charles	*Swedesboro'.*
Garrison, J. F.	*do.*
Gibbon, Quinton	*Salem.*
Goodell, Geo.	*Burlington City.*
Haines, Job	*Burlington.*
Hampton, Isaac H.	*Bridgeton.*
Hendry, Charles D.	*Camden Co.*
Hunt, T. Edgar	*Clarksville.*
Longstreet, H. H.	*Bordentown.*
Marsh, Elias J.	*Paterson.*
Martin, S. K.	*Martinville.*
Morford, A. D.	*Newton.*
Mulford, Isaac L.	*Camden.*
Munn, J. B.	*Chatham, Morris Co.*
Nichols, Whitfield	*Newark.*
Parrish, Joseph	*Burlington.*
Phillips, John H.	*Pennington.*
Pennington, Samuel H.	*Newark.*
Pierson, W.	*Orange.*
Porter, E. M.	*Bridgetown.*
Rogers, Alexander N.	*Paterson.*
Read, Zachariah	*Mount Holly.*
Schenck, F. S.	*Camden.*
Sickler, J. R.	*Carpenter's Land.*
Smith, Lyndon A.	*Newark.*
Steuart, J. R.	*Newton.*
Stratton, B. H.	*Mount Holly.*
Taylor, Othniel H.	*Camden.*
Thomson, Jno.	*Hoboken.*
Woodruff, A. D.	*Haddonfield.*

PENNSYLVANIA.

Allen, J. M.	*Philadelphia.*
Andrews, James P.	*Lancaster.*
Ashmead, William	*Philadelphia.*
Atlee, Washington L.	*do.*
Atlee, John L.	*Lancaster.*
Bache, Franklin	*Philadelphia.*
Bache, T. H.	*do.*

Baker, Charles L.	*Lancaster.*
Bare, A. S.	*do.*
Barrington, Samuel	*Philadelphia.*
†Baskin, George W.	*Mercer.*
Bell, John	*Philadelphia.*
Bertolet, P. G.	*Reading.*
Betton, Thomas F.	*Germantown.*
†Bibighaus, C. H.	*Philadelphia.*
Biddle, John B.	*do.*
Bird, J. F.	*do.*
Bond, Henry	*do.*
Breitenbach, J.	*Myerstown.*
Bridges, Robert	*Philadelphia.*
Brinton, John B.	*Westchester.*
Brown, H. J.	*Philadelphia.*
Bruce, S. D.	*Pittsburg.*
Bryan, Joseph R.	*Philadelphia.*
Bryan, James	*do.*
Burden, Jesse R.	*do.*
†Burrowes, Francis S.	*Lancaster.*
Carpenter, Henry	*do.*
Carpenter, James S.	*Pottsville.*
Carson, Joseph	*Philadelphia.*
Carson, William	*do.*
Cassidy, P.	*Lancaster.*
†Chapman, Nathaniel	*Philadelphia.*
Coates, B. Horner	*do.*
Condie, D. Francis	*do.*
Confer, J. M.	*Fasteria.*
Conrey, Jno.	*Manayunk.*
Corse, J. S.	*Philadelphia.*
Corson, Hiram	*Plymouth Meeting, Mont. Co.*
Corson, W.	*Norristown.*
Curtis, L.	*Philadelphia.*
Da Costa, T.	*do.*
Darlington, William	*Westchester.*
Dillard, T.	*Philadelphia.*
Dilworth, Samuel	*Pittsburg.*
Dorsey, J. H.	*Huntington.*
Drayton, H. E.	*Philadelphia.*
†Duffield, Samuel	*Lancaster.*

Duncan, Robt.	*Lancaster.*
Dyer, Jno.	*Danborough.*
Ehler, J. Augustus	*Lancaster.*
Ellmaker, Thomas	*do.*
Ely, Edward	*New Hope, Bucks Co.*
Emanuel, M.	*Marcus Hook.*
Emerson, Gouverneur	*Philadelphia.*
Emlen, J. V.	*do.*
Eshleman, J. K.	*Lancaster Co.*
Finley, W. R.	*Frankstown.*
Foulke, J. L.	*Gwynedd, Montgomery Co.*
Fox, George	*Philadelphia.*
Fronefield, Charles	*Montgomery Co.*
Gaston, A. K.	*Chester Co.*
Gazzam, Joseph P.	*Pittsburg.*
Gemmill, J. N.	*Alexandria.*
Gerhard, William W.	*Philadelphia.*
Gibson, William	*do.*
Gilbert, David	*do.*
Given, R. A.	*do.*
Goddard, P. B.	*do.*
†Grant, William R.	*do.*
Green, Jas. M.	*do.*
Green, Traill	*Easton.*
Gries, Wm.	*Reading.*
Gryder, M. R.	*Chestnut Level, Lancaster Co.*
Guilford, W. M.	*Lebanon.*
Haines, William S.	*Philadelphia.*
Halberstadt, Geo.	*Pottsville.*
Hallowell, Edward	*Philadelphia.*
Handy, J. H.	*do.*
Harry, Samuel H.	*Doe Run, Chester Co.*
Hart, Alexander C.	*Philadelphia.*
Hartshorne, Henry	*do.*
Hartshorne, Edward	*do.*
Hatfield, N. L.	*do.*
Hays, Isaac	*do.*
Heger, Anthony	*Pottsville.*
Herbst, Wm.	*Reading.*
Hewson, Addinell	*Philadelphia.*
Hiester, Frank M.	*Reading.*

Hiester, J. P.	*Reading.*
Hinkle, Franklin	*Lancaster.*
Hodge, Hugh L.	*Philadelphia.*
Hollingsworth, S. L.	*do.*
Horner, G. R. B.	*do.*
†Horner, William E.	*do.*
†Humes, Samuel	*Lancaster.*
Huston, Robert M.	*Philadelphia.*
Innes, Charles	*Easton.*
Irwin, John S.	*Pittsburg.*
Jackson, R. M. J.	*Cresson.*
Jackson, Samuel (Prof.)	*Philadelphia.*
Jackson, Samuel	*do.*
James, R. E.	*Stonechurch.*
James, Charles	*Easton.*
James, O. P.	*Doylestown.*
Janney, Benjamin S.	*Philadelphia.*
Jewell, Wilson	*do.*
Keating, Wm. V.	*do.*
Keith, William	*do.*
Keneagy, Samuel	*Strasburg, Lancaster Co.*
Kennedy, A. L.	*Philadelphia.*
Kerr, James W.	*York, York Co.*
†Kerfoot, George B.	*Lancaster.*
King, Charles R.	*Philadelphia.*
†Klapp, William H.	*do.*
Koehler, J. G.	*Schuylkill Haven.*
Lajus, D. Paul	*Philadelphia.*
Lang, Edmund	*do.*
Lamb, Jno. F.	*Frankford.*
La Roche, R.	*Philadelphia.*
†Leib, Henry F.	*do.*
Lewis, Samuel	*do.*
Littell, S.	*do.*
Lowman, Jno.	*Johnstown, Cambria Co.*
Luden, J. B.	*Huntingdon.*
Ludlow, J. L.	*Philadelphia.*
Mahon, O. S.	*Columbia.*
Martin, Chas. H.	*Allentown.*
Martin, J. A.	*Whitemarsh.*
Matthews, Charles H.	*Doylestown.*

Mayburry, William	*Philadelphia.*
McClellan, J. H. B.	*do.*
McCorkle, W. S.	*Columbia.*
McCoy, John M.	*Bellefonte.*
McCulloch, John	*Huntingdon.*
McIlvain, William	*York.*
Meigs, Charles D.	*Philadelphia.*
Mitchell, John K.	*do.*
Mitchell, Thomas D.	*do.*
Moore, John Wilson	*do.*
Morris, Casper	*do.*
†Morton, Samuel George	*do.*
Morton, C. J.	*Springfield.*
Mosser, D. O.	*Breinyville.*
Mowry, Robert B.	*Alleghany City.*
Muhlenburg, F. H.	*Lancaster.*
Muhlenburg, Henry E.	*do.*
Murphey, Andrews	*Parkesburg, Chester Co.*
Mütter, Thomas D.	*Philadelphia.*
Naudain, Arnold	*do.*
Neill, John	*do.*
Norris, George W.	*do.*
Ogier, S. A.	*Frazier, Chester Co.*
Orlady, H.	*Petersburg, Huntingdon Co.*
Page, William Byrd	*Philadelphia.*
Pancoast, Joseph	*do.*
Parker, Samuel E.	*Hempfield, Lancaster Co.*
†Parrish, Isaac	*Philadelphia.*
Parry, Ely	*Lancaster.*
†Patterson, Henry S.	*Philadelphia.*
†Patterson, George W.	*do.*
Paul, J. Rodman	*do.*
Pennypacker, I. A.	*do.*
Pepper, William	*do.*
Piper, W. A.	*do.*
Pollock, A. M.	*Pittsburg.*
Powell, F. W.	*Philadelphia.*
†Randolph, Jacob	*do.*
Raub, J. K.	*Quarryville.*
Ream, John	*Lancaster.*
Reese, J. J.	*Philadelphia.*

Remington, Isaac	*Philadelphia.*
Richards, C. O.	*Lancaster.*
Richardson	*Brooklyn.*
Rieser, Franklin	*Reading.*
Rivinus, Edward F.	*Westchester.*
Rodman, Lewis	*Philadelphia.*
†Rogers, James B.	*do.*
Rogers, R. E.	*do.*
Ross, J. D.	*Williamsburg.*
Rothrock, Abm.	*McVeytown.*
Ruschenberger, W. S. W.	*Philadelphia.*
Sargent, jr., Winthrop	*West Philadelphia.*
Sheller, Adam	*Mt. Joy, Lancaster Co.*
Shoemaker, Charles	*Jenkintown.*
Smaltz, J. H.	*Philadelphia.*
Smith, jr., Francis G.	*do.*
Smith, H. H.	*do.*
Smith, H. Y.	*do.*
Smith, R. K.	*do.*
Smith, Moses B.	*do.*
Spencer, Thomas D.	*do.*
Stanton, David	*New Brighton, Beaver Co.*
Stewart, J. D.	*Philadelphia.*
Stillé, Alfred	*do.*
†Stillé, Moreton	*do.*
Stocker, A. E.	*do.*
Stubbs, J. B.	*Rock P. O., Lancaster Co.*
Swift, Edward	*Easton.*
Thomas, George W.	*Norristown.*
Thomas, Isaac	*Westchester.*
Thomas, R. P.	*Philadelphia.*
Thomason, W. D.	*Harrisburg.*
Thompson, William S.	*Lancaster.*
Todd, J. E.	*Philadelphia.*
Townsend, R. H.	*do.*
Townsend, W. W.	*Chatham.*
Turnbull, Lawrence	*Philadelphia.*
Uhler, John	*do.*
Vanbuskirk, Wm. A.	*Pottstown, Montgomery Co.*
Wadsworth, Henry	*Philadelphia.*
Walker, Isaac R.	*Spread Eagle, Chester Co.*

Wallace, Edward	*Reading.*
Watson, William H.	*Bedford.*
West, Francis	*Philadelphia.*
Weidler, Isaac C.	*Seacock P. O., Lancaster Co.*
Wilcocks, Alexander	*Philadelphia.*
Wilson, William J.	*Potter's Mill, Centre Co.*
Wilson, Elwood	*Philadelphia.*
Wiltbank, John	*do.*
Wimley, G. W.	*Limerick Township, Mont. Co.*
Wister, Caspar	*Philadelphia.*
Wood, George B.	*do.*
Wood, Thomas	*Muncy, Lycoming Co.*
Worthington, Wilmer	*Westchester.*
Yardley, Thomas H.	*Philadelphia.*
Zeigler, J. L.	*Mount Joy P. O., Lancaster Co.*
Zeigler, George J.	*Philadelphia.*
Zulick, S. M.	*Orwigsburg.*

DELAWARE.

Askew, Henry F.	*Wilmington.*
Baker, George R.	*do.*
Bullock, W. R.	*do.*
Bush, Lewis P.	*do.*
Clark, R. H.	*Milford.*
Couper, James	*New Castle.*
Cummins, William	*Smyrna.*
Grimshaw, A. H.	*Wilmington.*
Hamilton, William N.	*Cantwell's Bridge.*
Jones, W.	*Vernon.*
Jump, Isaac	*Dover.*
Merritt, Jno.	*Middletown.*
Mitchell, J. R.	*Milford.*
Morris, William W.	*Dover.*
Perkins, John D.	*Smyrna.*
Porter, Robert R.	*Wilmington.*
Saulsbury, G.	*Dover.*
†Smith, Thomas Mackie	*Brandywine.*
Thomson, James W.	*Wilmington.*
Wales, J. P.	*Brandywine.*
Wilson, James F.	*Wilmington.*

Alexander, Ashton	*Baltimore.*
Armitage, James	*do.*
Atkinson, Thomas C.	*do.*
Backler, Thomas H.	*do.*
Baer, M. S.	*do.*
Baker, Alfred	*do.*
Baldwin, E. C.	*do.*
Baltzell, W. H.	*do.*
Baxley, Willis H.	*do.*
Belt, W. F.	*Prince George.*
Bolton, James	*Baltimore.*
Bond, Thomas E.	*do.*
Bordley, James	*do.*
Boyd, Charles	*Frederick City.*
Briscoe, John H.	*Baltimore.*
Chamberlaine, J. E. M.	*Easton.*
Chew, Samuel	*Baltimore.*
Clarke, S. R.	*do.*
Cohen, Joshua J.	*do.*
Cox, C. C.	*Easton.*
Crane, W. B.	*Baltimore.*
Dallam, William M.	*Harford Co.*
Davis, William H.	*Baltimore.*
Dawson, James	*St. Michael's, Talbot Co.*
Donaldson, Francis	*Baltimore.*
Dorsey, Lloyd	*Frederick.*
Dulin, Alexander F.	*Baltimore.*
Dunbar, John R. W.	*do.*
Duvall, E. P.	*do.*
Duvall, W.	*Washington, Montgomery Co.*
Fonerden, John	*Baltimore.*
Frick, Charles	*do.*
Gibson, George S.	*do.*
Gibson, J. Grigg	*Fredericktown.*
Gilman, J.	*Baltimore.*
Goldsborough, H. T.	*Easton, Talbot Co.*
Gunn, John P.	*Baltimore.*
Handy, Samuel K.	*Somerset Co.*
Hardcastle, E. M.	*Trappe.*

Harris, Chapin A.	*Baltimore.*
Hemsley, W.	*Caroline Co.*
Hintze, F. E. B.	*Baltimore.*
Hopkins, Joel	*Elkridge Landing, Howard Co.*
Jameson, sen., Horatio G.	*Baltimore.*
†Jenkins, Solomon M.	*Easton.*
Johnstone, C.	*Baltimore.*
Kennard, T. C.	*Harmony.*
Kinnemann, P. S.	*Baltimore.*
Kinney, jr., William	*do.*
Laurence, G. W.	*Catonsville.*
Leonard, William T.	*Baltimore.*
Martin, Thomas W.	*Dorchester Co.*
Macgill, C.	*Hagerstown.*
Matthews, Thomas	*Milestown.*
Miltenberger, G. W.	*Baltimore.*
Monkur, John C. S.	*do.*
Monmonier, J. T.	*do.*
Murray, R. (U. S. A.)	*do.*
O'Donnel, D. A.	*do.*
Pinckney, Ninian (U. S. N.)	*Annapolis.*
Piggot, A. S.	*Baltimore.*
Power, William	*do.*
Riley, William	*do.*
Roberts, George C. M.	*do.*
Robinson, Alexander C.	*do.*
Roby, Joseph	*do.*
Sappington, J. K.	*Havre-de-Grace.*
Sappington, Thomas	*Liberty, Frederick Co.*
Smith, Nathan R.	*Baltimore.*
Smith, Samuel P.	*Cumberland.*
Steiner, L. H.	*Baltimore.*
Steuart, R. S.	*do.*
Stevenson, J. S.	*do.*
Stokes, William H.	*do.*
Teackle, John N.	*do.*
Theobald, Elisha W.	*do.*
Thomas, Richard H.	*do.*
Tyler, Samuel	*Frederick City.*
Warfield, Jesse L.	*Westminster, Carroll Co.*
Webster, John Lee	*Baltimore.*

White, A. M.	*Easton.*
Williams, W.	*Somerset Co.*
Wroth, Peregrine	*Chestertown.*
Wynne, James	*Baltimore.*
Yeates, John L.	*do.*

DISTRICT OF COLUMBIA.

Boyle, Cornelius	*Washington.*
Busey, S. C.	*do.*
Coolidge, R. H.	*do.*
Dove, G. M.	*do.*
Duhamel, W. J. C.	*do.*
Garnett, A. Y. P.	*do.*
Hall, J. C.	*do.*
Hellen, B. J.	*do.*
Johnston, William P.	*do.*
Lindsley, Harvey	*do.*
May, J. F.	*do.*
Miller, Thomas	*do.*
Morgan, James E.	*do.*
Riley, J. C.	*do.*
Riley, Joshua	*Georgetown.*
Semmes, A. J.	*Washington.*
Stone, Robert K.	*do.*
Thomas, John M.	*Georgetown.*
Tyler, Grafton	*do.*
Young, N.	*Washington.*

VIRGINIA.

Allen, B. W.	
Ashby, C. H.	*Culpepper C. H.*
Atkinson, Thomas P.	*Danville.*
Barr, S. B. F. C.	*Big Spring, Taylorsville.*
Bates, W. J.	*Wheeling.*
Belt, H. S.	*Pittsylvania.*
Bolton, James	*Richmond.*
Brooks, John N.	*do.*
Browne, O. A.	*Hicksford.*
Brown, P. F.	*Acowac.*
Burruss, J. L.	*Louisa C. H.*
Cabell, James L.	*University of Virginia.*

Cabell, J. G.	*Richmond.*
Carmichael, George F.	*Fredericksburg.*
Cochran, William B.	*Loudon Co.*
Coleman, J. C.	*Richmond.*
Cooke, A. T. M.	*Norfolk.*
Corbin, G. Lane	*Half-Way House, York Co.*
Cox, Thomas E.	*Richmond.*
Creigh, Thomas	*Louisburg.*
Craghead, W. G.	*Danville.*
Cunningham, Jno. A.	*Richmond.*
Dillon, A. S.	*Faronville.*
Dorset, J. L.	*Powhattan.*
Dove, James	*Richmond.*
Dove, Jno.	*do.*
Faunt Le Roy, John	*White Post, Clarke Co.*
Frissell, John	*Wheeling.*
Gibson, Charles Bell	*Richmond.*
†Gooch, P. Claiborne	*do.*
Hancock, F. W.	*do.*
Harrison, E. J.	*Cartersville P. O., Cumberland.*
Haskin, U. D.	*Richmond.*
Haxall, Robert W.	*do.*
Hildreth, E. A.	*Wheeling.*
Houston, M. H.	*do.*
Howard, Henry	*University of Virginia.*
Hurt, J. M.	*Holloway City.*
†Johnson, Carter P.	*Richmond.*
Johnson, James	*Hicksford.*
Joynes, Levin S.	*Accomack C. H.*
Kemper, Charles R.	*Woodville, Rappahannock Co.*
Lake, R. P.	*Richmond.*
Lee, George	*Leesburg, Loudon Co.*
Lewis, T.	*King and Queen, Stevensville P. O.*
Little, John	*Richmond.*
Lumpkin, Jno. G.	*Hanover.*
Lyle, Jas.	*Prince Edward.*
Magill, Henry D.	*Leesburg.*
Mason, A. H.	*Falmouth.*
†Massie, H.	*Charlottsville.*
McElhenny, S. W.	*Wheeling.*
McGuire, Hugh H.	*Winchester.*

Meriwether, W. D.	*Richmond.*
Mettauer, J. P.	*Prince Edward C. H.*
Merritt, A. T. B.	*Richmond.*
Mills, Charles S.	*do.*
Moore, W. J.	*Norfolk.*
Morrison, E. A.	*Lawrence.*
Moseley, W. P.	*Buckingham.*
Nicholson, G. L.	*Middlesex Co.*
Otis, George A.	*Richmond.*
Parker, W. W.	*do.*
Patrick, S.	*Kanawha C. H.*
Patteson, W. A.	*Richmond.*
Patteson, Samuel A.	*Manchester, Chesterfield.*
Payne, A. S.	*Paris, Fauquier Co.*
Peebles, J. F.	*Petersburg.*
Powell, H. B.	*Alexandria.*
Powell, F. W.	*Middleburg.*
Power, R. H.	*Yorktown.*
Quarles, Charles	*Mechanicsville, Louisa Co.*
Randolph, Robert C.	*Mellwood P. O., Clarke Co.*
Roddey, F. W.	*Richmond.*
Rogers, R. E.	*University of Virginia.*
Scott, Martin P.	*Richmond.*
†Selden, William	*Norfolk.*
†Selden, Henry	*do.*
Silvester, R. W.	*do.*
Smith, J. W.	*Petersburg.*
Snead, Albert	*Richmond.*
Spencer, T. C.	*Petersburg.*
Spilter, Adam	*Buchanan, Upshire Co.*
Tabb, J. Prosser	*Gloucester Co.*
Taylor, Kidder R.	*Richmond.*
Terrill, G. F.	*Caroline Co.*
Thweatt, J. J.	*Petersburg.*
Trent, W. W.	*Richmond.*
Trent, P.	*do.*
†Trigg, Daniel	*Abingdon.*
Tucker, A. B.	*Winchester.*
Tucker, David H.	*Richmond.*
†Upshur, George L.	*Norfolk.*
Walke, J. Wistar	*Chesterfield.*

Walshe, Samuel	*Prince George Co.*
Wellford, Beverley R.	*Fredericksburg.*
Wellford, J. S.	*do.*
White, Luke	*Petersburg.*
Wilson, W. E.	*Richmond.*
Wilson, G. A.	*do.*
Wortham, A. G.	*do.*
Worsham, H. C.	*Dinwiddie.*
Yearby, George T.	*Eastville, Northampton.*

NORTH CAROLINA.

Belt, H. Singleton	*Winston, Forsyth C. H.*
Dewey, L. F.	*Goldsboro'.*
Dickson, J. H.	*Wilmington.*
Erwin, J. S.	*Marion.*
Jones, J. B.	*Chapel Hill.*
Mabrey, B. W.	*Tarboro'.*
Manson, O. F.	*Lynesville.*
Mercer, Jno. R.	*Tarborough.*
McKee, W. H.	*Raleigh.*
McKee, W. L.	*Morgantown, Burke Co.*
Myers, J. G. B.	*Washington.*
Norwood, Walter A.	*Hillsboro',*
Pittman, Newson J.	*Rocky Mount.*
Thomas, W. G.	*Tarborough.*
Thomas, G. W.	*Wilmington.*
Thompson, Jno. R.	*Raleigh.*
Tull, J. G.	*Newbern.*
Warren, W. C.	*Edenton.*
Webb, William	*Hillsboro'.*

SOUTH CAROLINA.

Bailey, R. S.	*Charleston.*
Barratt, Jno. P.	*Abbeville.*
Barker, Sanford W.	*Charleston.*
Bellinger, Jno.	*do.*
Bradley, B. W.	*King's Tree, Williamsburg.*
Cain, D. J.	*Charleston.*
Clawson, C. L.	*Nation Ford.*
Coffin, Amory	*Aiken,*
Crane, Joseph S.	*Columbia.*

Dawson, J. L.	*Charleston.*
De Saussure, H. W.	*do.*
Dickson, Samuel Henry	*do.*
Elfe, Edward	*do.*
Elliott, Thomas A.	*Orangeburg.*
Fair, Samuel	*Columbia.*
Flagg, C. Beling	*Charleston.*
Ford, Wm. H.	*do.*
Frost, Henry R.	*do.*
Gaillard, Peter C.	*do.*
Geddings, E.	*do.*
Geddings, J. F. M.	*do.*
Gibbes, N. H.	*St. Helena.*
Goodwyn, T. J.	*Orangeburg.*
Happoldt, C.	*Charleston.*
Hazell, Andrew	*All Saints.*
Holbrook, J. E.	*Charleston.*
Hook, J. H.	*St. Matthew's.*
Horlbeck, Elias	*Charleston.*
Horlbeck, W. C.	*do.*
Jervey, James P.	*do.*
Kinlock, R. A.	*do.*
Lebby, Robert	*do.*
Lynch, John	*Cheraw.*
May, Jno.	*St. George's P. O.*
Mayes, J. A.	*Maysville.*
McKain, Wiley J.	*Camden.*
Michel, R. F.	*Charleston.*
Miller, W. C.	*Georgetown.*
Mitchell, Edward	*Edisto.*
Mitchell, M.	*Charleston.*
Mitchell, J. S.	*do.*
Mobley, W. W.	*Lancasterville.*
Moultrie, James	*Charleston.*
Moultrie, W. L.	*St. John's, Berkley.*
Muller, G.	*Lexington.*
Ogier, T. L.	*Charleston.*
Porcher, Francis Y.	*do.*
Porcher, F. Peyre	*do.*
Prioleau, Thomas G.	*do.*

Prioleau, J. Ford	*Charleston.*
Purchin, F.	*do.*
Ravenel, St. Julien	*do.*
Ready, J. C.	*Edgefield.*
Robertson, F. M.	*Charleston.*
Robertson, T. S.	*Winsboro'.*
Rodrigues, B. A.	*Charleston.*
Saussure, H. W.	*do.*
Simons, T. Y.	*do.*
Smith, Thomas	*Society Hill.*
Waring, Morton	*Black Oak.*
White, O.	*Charleston.*
Williams, Alexander	*Chesterfield.*
Williman, A. B.	*Charleston.*
Winthrop, Henry	*do.*
Wragg, William T.	*do.*

GEORGIA.

Arnold, Richard D.	*Savannah.*
Black, R. C.	*Augusta.*
Bullock, W. Gaston	*Savannah.*
Campbell, H. F.	*Augusta.*
Campbell, Robert	*do.*
Dugas, L. A.	*do.*
Eve, Joseph A.	*do.*
Ford, L. D.	*do.*
Garvin, J. P.	*do.*
Gilbert, J. C.	*Perry.*
Green, James N.	*Macon.*
Harris, Stephen N.	*Savannah.*
Harris, Juriah	*Augusta.*
Hofey, Thomas	*Columbus.*
Howard, J. Gordon	*Madison.*
Jones, W. B.	*Atlanta.*
Kollock, Phineas M.	*Savannah.*
Moore, Richard D.	*Athens.*
Nottingham, C. B.	*Macon.*
Ogilby, Hugh J.	*Madison.*
Phinizy, T. B.	*Augusta.*
Posey, John F.	*Savannah.*
Quintard, C. T.	*Roswell.*

Read, James B.	*Savannah.*
Richardson, C. P.	*do.*
Robertson, J. G.	*do.*
Ruffin, W. R.	*Augusta.*
Simmons, J. N.	*Griffin.*
Thompson, E. J.	*Augusta.*
Tufts, Johnson B.	*Savannah.*

ALABAMA.

Anderson, L. H.	*Sumterville.*
Anderson, W. H.	*Mobile.*
Blakey, Boling A.	*Montgomery.*
Boling, Wm. M.	*do.*
Cabell, P. H.	*Selma.*
Clanton, S. W.	*Warsaw.*
Denny, A.	*Suggsville.*
English, I. A.	*Cahaba.*
Gordon, F. E.	*Marion.*
Hargraves, J. T.	*Florence.*
Johnson, W. B.	*Marion, Perry Co.*
Jones, Benjamin R.	*Montgomery.*
Lopez, A.	*Mobile.*
Merewether, G. M.	*Line Creek.*
Miller, R.	*Mobile.*
Percival, C. F.	*Lowndes Co.*

LOUISIANA.

Barton, Edward H.	*New Orleans.*
†Carpenter, William M.	*do.*
Fenner, E. D.	*do.*
†Harrison, J.	*do.*
Jones, James	*do.*
Nott, G. A.	*do.*
Simonds, J. C.	*do.*

MISSISSIPPI.

Grafton, Thomas J.	*Rodney.*
Keirn, G.	*Lexington, Holmes Co.*

TENNESSEE.

Avent, B. W.	*Murfreesborough.*
Bowling, W. K.	*Nashville.*
Buchanan, A. H.	*do.*
Clements, H. M.	*Clementsville.*
Conwell, Ira	*Nashville.*
Dabney, E. R.	*Clarksville.*
Eve, Paul F.	*Nashville.*
Foster, R. C.	*do.*
Grant, George	*Memphis.*
Guthrie, C. B.	*do.*
Haggart, Wm. D.	*Gallatin.*
Harris, S. H.	*Nashville.*
Harris, Zeno	*Memphis.*
Haskins, E. B.	*Clarksville.*
Johnston, J. L. C.	*New Providence.*
Lenoir, B. B.	*Roane Co.*
Lindsley, J. B.	*Nashville.*
Lipscomb, Thomas	*Shelbyville.*
Litton, A.	*Nashville.*
Millington, John	*Memphis.*
Porter, R. C.	*Nashville.*
Ramsey, Frank A.	*Knoxville.*
Shanks, Lewis	*Memphis.*
Thomas, N. L.	*Clarksville.*
Winston, C. K.	*Nashville.*

KENTUCKY.

Bell, T. S.	*Louisville.*
Blackburn, C. J.	*Covington.*
Bradford, J. T.	*Augusta.*
Breckinridge, R. J.	*Louisville.*
Bush, J. M.	*Lexington.*
Chambers, Wm. M.	*Covington.*
Cook, A. B.	*Louisville.*
Edwards, R. A.	*Wallon, Boone Co.*
Evans, Asbury	*Covington.*
Fitch, G. N.	*Logan's Port.*
Flint, J. B.	*Louisville.*
Freeman, D. L.	*Floydsburg.*

Gross, S. D.	*Louisville.*
Holt, W. D.	*Covington.*
Johnston, J. C.	*Louisville.*
Lincoln, J.	*do.*
Miller, Henry H.	*do.*
Moore, Thomas J.	*Harrodsburg.*
Norwood, Walter A.	*Henderson.*
Powell, L.	*Louisville.*
Raphael, B. J.	*do.*
Ray, L. G.	*Paris, Bourbon Co.*
Richardson, T. G.	*Louisville.*
Spillman, C. H.	*Harrodsburg.*
Stevens, B. L.	*Union, Boone Co.*
Sutton, W. L.	*Georgetown.*
Thomson, D. D.	*Louisville.*
Yandell, D. W. L.	*do.*
Yandell, L. P.	*do.*

OHIO.

Armor, S. G.	*Cincinnati.*
Arons, Jno. J.	*do.*
Austin, A.	*Sandusky.*
†Awl, William M.	*Columbus.*
Ayres, A.	*Greenville.*
Baird, James M.	*Bourneville.*
Baker, Abraham H.	*Cincinnati.*
Baker, T. H.	*Wayne Co.*
Battles, W. S.	*Edinburg.*
Bigelow, J. M.	*Lancaster.*
Boerstler, G. H.	*do.*
Bonner, S.	*Cincinnati.*
Branson, Smith	*Chester Hill.*
Briggs, J. M.	*Marion.*
Buckner, Philip J.	*Georgetown.*
†Butterfield, J.	*Columbus.*
Carey, Abel	*Salem.*
Carey, Harvey G.	*Dayton.*
Carroll, Thomas	*Cincinnati.*
Carson, William	*Chillicothe.*
Carter, Francis	*Columbus.*
Charters, W. M.	*Lebanon, Warren Co.*

Clements, Joshua	*Dayton.*
Clendennin, William	*Cincinnati.*
Cochrane, Charles	*Sandusky.*
Colton, C. D.	*Marietta.*
Comegys, C. G.	*Cincinnati.*
Conklin, H. Smith	*Sidney, Shelby Co.*
Coons, Israel A.	*Dayton.*
Corson, J.	*Portsmouth.*
Cotton, C. D.	*Marietta.*
Cox, D. A.	*New Paris.*
Crews, James H.	*Upshur, Preble Co.*
Crume, Pliny M.	*Eaton, Preble Co.*
Dandridge, A. S.	*Cincinnati.*
Davis, F. H.	*Chillicothe.*
Dawson, Jno.	*Columbus.*
Delamater, Jacob J.	*Cleveland.*
Dodge, J. S.	*Cincinnati.*
Dorsey, G. Volney	*Piqua.*
†Drake, Daniel	*Cincinnati.*
Dunahoe, H. J.	*Sandusky.*
Dunlap, A.	*Ripley.*
Eaton, T. J.	*New Paris, Preble Co.*
Edwards, Thomas O.	*Cincinnati.*
Effinger, M.	*Lancaster.*
Ferris, S.	*New Westville.*
Fisher, Elias	*Waynesville, Warren Co.*
Ford, P. G.	*Cincinnati.*
Fries, George	*Hanovertown.*
Gard, J. N.	*Greenville.*
Gaston, Ephraim	*Morristown.*
Gillet, B.	*Springfield.*
Gordon, Thomas W.	
Grant, Charles	*Cincinnati.*
Griswold, L. D.	*Elysia.*
Gundry, Richard	*Columbus.*
†Harrison, John P.	*Cincinnati.*
Henderson, J. P.	*Newville.*
Heterick, A. B.	*Georgetown.*
Hills, Ralph	*Columbia.*
Holston, J. G. F.	*Zanesville.*
Howard, Richard L.	*Columbus.*

Huestis, Isaac	*Chester Hill.*
Hughes, C. B.	*Cincinnati.*
Hunt, Samuel P.	*Morrow, Warren Co.*
Hurxthal, Frederick	*Massillon.*
Janes, N. W.	*Toledo.*
Johnston, A. M.	*Cincinnati.*
Jones, C.	*West Union.*
Jones, W. W.	*Toledo.*
Judkins, David	*Cincinnati.*
Judkins, J. P.	*do.*
Judkins, William	*do.*
Kreider, M. Z.	*Lancaster.*
Lane, E. S.	*Sandusky.*
Langdon, O. M.	*Cincinnati.*
Lawson, L. M.	*do.*
Leonard, B. B.	*West Liberty.*
Mack, H. O.	*Shelby.*
Magguin, J. C.	*Fayetteville.*
Martin, Joshua	*Xenia.*
McArthur, J. W.	*Wilmington.*
McDermot, C.	*Dayton.*
McGrew, J. S.	*Montgomery, Hamilton Co.*
McIlvaine, R. R.	*Cincinnati.*
McMally, Thomas	*Chillicothe.*
McMeens, R. R.	*Sandusky.*
Mendenhall, George	*Cincinnati.*
Mitchell, G. F.	*Mansfield.*
Moxley, M. R.	*Wheelersburg.*
Moxley, T. S.	*Irontown.*
Munson, A. W.	*Kenton.*
Musgrave, H. B.	*Cincinnati.*
Musgrove, A.	*Urbana.*
Mussey, F. B.	*Cincinnati.*
Mussey, Reuben D.	*do.*
Neff, B.	*Piqua.*
†Norton, J. C.	*Marion.*
Norton, O. D.	*Cincinnati.*
Philips, W. H.	*Kenton.*
Potter, J. F.	*Cincinnati.*
Raymond, C. H.	*do.*
Read, A. M.	*Norwalk.*

Richards, Wolcott	*Cincinnati.*
Rives, L. C.	*do.*
Robertson, C.	*McConnelsville.*
Robinson, J. D.	*Wooster, Wayne Co.*
Sachse, G. J.	*Lancaster.*
Safford, R.	*Putnam.*
Sams, C. C.	*Hillsborough.*
Sayles, J. A.	*Cleveland.*
Schenck, C. F.	*Columbus.*
Shenck, W. L.	*Franklin.*
Sheets, L. D.	*Dayton.*
Sheldon, B.	*Cleveland.*
Sibley, E. H.	*Medina.*
Slusser, Lewis	*Canton.*
Smith, A. C.	*Medina C. H.*
Smith, Edwin	*Dayton.*
Smith, John A.	*Piqua.*
Smith, Samuel M.	*Columbus.*
Smith, S. Hanbury	*do.*
Spillman, Henry	*Medina.*
Steele, H. K.	*Dayton.*
Stevens, Joshua	*Lebanon.*
St. John, Samuel	*Cleveland.*
Strader, D. P.	*Cincinnati.*
Taggart, W. W.	*Smithville, Wayne Co.*
Taliaferro, W. I.	*Cincinnati.*
Tappan, B.	*Steubenville.*
Taylor, James	*Cincinnati.*
Thompson, J. B.	*Columbus.*
Thompson, R.	*do.*
Tilden, D.	*Sandusky, Erie Co.*
Trevitt, Wm.	*Columbus.*
Tweed, T. M.	*Eckmansville.*
Updegraff, J. T.	*Mount Pleasant.*
Vanharlingen, I.	*Lebanon.*
Vattier, J. L.	*Cincinnati.*
Walker, J. P.	*do.*
Waterman, L. D.	*do.*
West, Henry	*Clairsville, Belmont Co.*
White, James	*Lancaster.*
White, John F.	*Cincinnati.*

White, T. W.	*Toledo.*
Williams, I. C.	*Bloomington.*
Wood, Thomas	*Cincinnati.*
Woodward, Charles	*do.*
Wright, James	*Belmont.*
Wright, M. B.	*Cincinnati.*

INDIANA.

Ayers, H. P.	*Fort Wayne.*
Boyd, S. S.	*Jacksonburg.*
Brelsford, Joseph	*Plymouth.*
Byford, W. H.	*Evansville.*
Cameron, R. A.	*Valparaiso.*
Clapp, A.	*New Albany.*
Clapp, W. A.	*do.*
Darnall, M. D.	*Bainbridge.*
Dicken, James L.	*Somerset.*
Dickey, William	*Dalton.*
Florrer, T. W.	*Alamo.*
Haymond, R.	*Brookville.*
Holt, Willis W.	*Vincennes.*
Horne, S. S.	*Marion.*
Humphries, Lewis	*South Bend.*
Hutchinson, David	*Mooresville.*
John, H. V. V.	*Indianapolis.*
Johnson, Nathan	*Cambridge City, Wayne Co.*
Kersey, Vierling	*Milton.*
Latta, Milton M.	*Goshen.*
Leedy, J. K.	*Warsaw, Kosciusko Co.*
Leonard, S. E.	*New Albany.*
Lomax, William	*Marion.*
Lyons, W. B.	*Huntington.*
Martin, William H.	*Rushville.*
Maclean, George M.	*New Albany.*
Mears, G. W.	*Indianapolis.*
Meekes, D.	*Laport.*
Morgan, Daniel	*Evansville.*
Mothershead, I. L.	*Indianapolis.*
Muker, David	*Laport.*
Mullen, Alexander J.	*Napoleon, Ripley Co.*
Murphy, Edward	*New Harmony, Posey Co.*

Parry, Charles	*Indianapolis.*
Patterson, R. J.	*do.*
Pennington, Joel	*Milton, Wayne Co.*
Ronalds, Hugh	*Evansville.*
Rose, Landon C.	*Laporte.*
Sarber, W. E.	*Palestine.*
Sexton, H. G.	*Rushville.*
Sheets, L. D.	*Liberty.*
Shively, James S.	*Marion, Grant Co.*
Sommes, Joseph	*Vincennes.*
Sutton, George	*Aurora.*
Town, R. R.	*New Albany.*
Winton, Wm. R.	*Wabash.*
Woodworth, B. S.	*Fort Wayne.*

ILLINOIS.

Adams, Nichols	*Quincy.*
Allen, George T.	*Marine.*
Andrews, E.	*Chicago.*
Bailey, F. K.	*Joliet, Will Co.*
Baldwin, S. Y.	*Decatur.*
Bane, Wm. M.	*Payson.*
Banks, E. C.	*Charleston.*
Blaney, J. V.'Z.	*Chicago.*
Bloodgood, James	*do.*
Brainard, Daniel	*do.*
Bridges, V. R.	*Salsbury.*
Bunce, James	*Galesburg.*
Clark, Charles W.	*Rockford.*
Colburn, E. M.	*Peoria.*
Coolidge, Charles	*Warsaw.*
Cooper, E. S.	*Peoria.*
Coopins, P. G.	*Fairweather.*
Davis, N. S.	*Chicago.*
Davis, Wm. H.	*La Salle.*
Dickinson, Edward	*Peoria.*
Edwards, Willis G.	*Alton.*
Evans, John	*Chicago.*
Everett, S. W.	*Quincy.*
Fitch, T. D.	*Kewanu.*
Freer, J. W.	*Chicago.*

Frye, Joseph C.	*Peoria.*
Golleday, H. P.	*Lacon.*
Goodbrake, C.	*Clinton.*
Gregg, P.	*Rock Island.*
Hamilton, Wm. R.	*Peoria.*
Harriman, H. C.	*Jerseyville.*
Hard, C.	*Ottawa.*
Harrington, W. C.	*Payson.*
Herrick, W. B.	*Chicago,*
Herrick, Josiah B.	*Vandalia.*
Hinsey, Jos. C.	*Pekin.*
Hollester, J. H.	*Chicago.*
King, Joseph	*Decatur.*
Kirwan, P.	*Ottawa.*
Knox, Wm. A.	*Rock Island.*
Long, S.	*Springfield.*
Luce, A. H.	*Bloomington.*
Maus, Jos. S.	*Perkin.*
Maus, W. S.	*do.*
McArthur, A. S.	*Joliet.*
Miller, De Laskie	*Chicago.*
Nance, Hiram	*Lafayette.*
Noble, H.	*Bloomington.*
Noble, S. W.	*Le Roy.*
Paddock, S. A.	*Princeton.*
Palmer, A. B.	*Chicago.*
Parker, Henry	*do.*
Prince, David	*Jacksonville.*
Quigley, W. C.	*Chicago.*
Ralston, J. W.	*Quincy.*
Robinson, W.	*Dover.*
Rogers, T. P.	*Bloomington.*
Rouse, Rudolphus	*Peoria.*
Shepherd, M.	*Payson, Adams Co.*
Skelling, David	*Winchester.*
Smith, H. M.	*Vincennes.*
Stahl, Daniel	*Quincy.*
Stout, Joseph	*Ottawa.*
Stipp, George W.	*Bloomington.*
Thompson, Samuel	*Albion, Edwards Co.*
Trowbridge, S. J.	*Decatur.*

Varien, Wm.	*Chicago.*
Washburn, Thomas	*Lawrenceville.*
Welch, Wm. W.	*La Salle.*
Williams, Hezekiah	*Alton.*
Wood, Wm.	*Cairo.*

MISSOURI.

Adison, Stephen	*St. Louis.*
Alleyne, J. S. B.	*do.*
Alexander, John B.	*Lexington.*
Athurson, J. F.	*do.*
Baines, Jno.	*St. Louis.*
Barrel, R. T.	*do.*
Baumgarten, Fred. E.	*do.*
Chandler, Chas. Quarles	*Rockfort.*
Clarke, R.	*St. Louis.*
Coons, A. J.	*do.*
Cooper, D. M.	*do.*
Currie, Wm.	*Jefferson City.*
Edgar, Wm. S.	*St. Louis.*
Engleman, George	*do.*
Golding, Walter S.	*do.*
Hartt, George C.	*Booneville.*
Hempstead, C. W.	*St. Louis.*
Holmes, R. S.	*do.*
Johnson, George	*do.*
Johnson, John B.	*do.*
Johnson, Richard P.	*do.*
Lemoine, E. S.	*do.*
Lewis, R. K.	*Huntsville.*
Magoffin, John	*St. Louis.*
Massie, T. E.	*do.*
McDowell, Joseph	*do.*
McMurray, John H.	*Independence.*
McPheeters, Wm. M.	*St. Louis.*
Meade, D. E.	*do.*
Moore, John S.	*do.*
Moses, S. Gratz	*do.*
Perry, L. P.	*do.*
Peur, George	*Fee-fee.*
Pollak, S.	*St. Louis.*

Pope, Charles A.	*St. Louis.*
Reyburn, Thomas	*do.*
Reynolds, J. W.	*Fort William.*
Riley, A. A.	*Fulton.*
Schaenrick, H.	*St. Louis.*
Shoemacher, Hammond	*Milwood.*
Scott, J. W.	*St. Louis.*
Smith, J. D.	*Fayette.*
Smith, E. F.	*St. Louis.*
Stevens, C. W.	*do.*
Tandy, D. C.	*do.*
Vaughn, Isaac P.	*Glasgow.*
Walker, George S.	*St. Louis.*
Washington, James R.	*do.*
Welborn, John C.	*Frankford.*
Wilson, J. W.	*St. Louis.*
Wislizénus, Adolphus	*do.*
Woodson, John C.	*Spencerburg.*

MICHIGAN.

Allen, J.	*Ann Arbor.*
Andrews, J.	*Pawpaw.*
Arnold, S. R.	*Monro.*
Axford, S. M.	*Flint.*
Barnum, B.	*Schoolcraft.*
Beech, J. H.	*Coldwater.*
Brodie, Wm.	*Detroit.*
Brown, J. A.	*do.*
Christian, E. P.	*do.*
Clapp, H. C.	*Pawpaw.*
Cobb, H. P.	*Detroit.*
Cone, E. D.	*Hillsdale.*
Cox, Edward	*Battle Creek.*
Denton, S.	*Ann Arbor.*
Douglass, S. H.	*do.*
Durton, Samuel	*do.*
Fanner, C. P.	*do.*
French, S. B.	*Battle Creek.*
Gorton, J. C.	*Detroit.*
Gunn, Moses	*do.*
Haze, W. H.	*Parmington.*

Inglis, R.	*Detroit.*
Johnson, G. K.	*Pontiac.*
Kibbie, J.	*Port Huron.*
Kinney, M. C.	*Lapeer.*
Klein, P.	*Detroit.*
Leasia, J. A.	*Lansing.*
Leland, A. L.	*Detroit.*
Leete, Albert E.	*Romeo.*
Leach, E.	*Owassa.*
McCollom, C.	*Romeo.*
Murray, Andrew	*Niles.*
Nims, Dwight	*Homer.*
Paddach, J.	*Pontiac.*
Palmer, A. B.	*Tecumseh,*
Patterson, M. A.	*do.*
Pierce, James L.	*Corunna.*
Pitcher, Zina	*Detroit.*
Platt, A.	*Grand Rapids.*
Potter, A. O.	*Ann Arbor.*
Rice, R. S.	*Detroit.*
Robinson, L. G.	*do.*
Russell, Geo. B.	*do.*
Sager, A.	*Ann Arbor.*
Seely, T. P.	*do.*
Shepard, Charles	*Grand Rapids.*
Stebbins, N. D.	*Detroit.*
Storm, A. R.	*Almont.*
Stockwell, C. M.	*Port Huron,*
Stewart, Morse	*Detroit.*
Stone, A. R.	*Almonte.*
Smith, J. S.	*Armada.*
Tompkins, L. D.	*Cassapolis.*
Tanner, C. P.	*Ann Arbor.*
Taylor, Hen.	*Mount Clemens.*
Tillson, Philo	*Romeo.*
Tripler, C. S.	*Detroit.*
Wells, B. P.	*Adis.*
Wells, E.	*Ann Arbor.*
White, John B.	*Saginaw.*

IOWA.

Adler, John	*Davenport.*
Armour, Samuel G.	*Keokuk.*
Arnold, Edward A.	*Davenport.*
Elbert, Jno. D.	*Keosauqua, Van Buren Co.*
Ely, Jno. F.	*Cedar Rapids.*
Ford, E. R.	*Keokuk.*
Francis, E. C.	*do.*
Hughes, J. C.	*do.*
Lewis, R. S.	*Dubuque.*
Lyons, W. B.	*Huntington.*
Malcolm, A. B.	*Dubuque.*
McGugin, D. C.	*do.*
Rauch, J. H.	*Burlington.*
Sanborn, J. E.	*Keokuk.*
Sanford, John F.	*do.*
Siveter, Thomas	*Salem.*
Van Patten, N.	*Davenport.*
White, J. W.	*Stockport.*

WISCONSIN.

Ayres, D. Cooper	*Green Bay.*
Bartlett, John K.	*Milwaukee.*
Brisbane, W. Henry	*Arena.*
Brown, J. J.	*Madison.*
Castleman, A. L.	*Delafield.*
Chapman, C. B.	*Madison.*
Douseman, John B.	*Milwaukee.*
McKinley, Hays	*Kenosha.*
Pease, C. G.	*Janesville.*
Thorn, Samuel S.	*Milwaukee.*
Wilbur, George	*Mineral Point.*

MINNESOTA TERRITORY.

Le Boutillier, C. W.	*St. Anthony.*
Murphy, John	*do.*
Potts, Thomas R.	*St. Paul.*

CHEROKEE NATION.

Ross, R. D.	*Grand Sabine.*

UNITED STATES ARMY.

Cuyler, J. M.
McLaren, A. N.
Moses, Israel.
Porter, J. B.
Tripler, Chas.

UNITED STATES NAVY.

Barrington, Samuel
Delany, M. G.
Dillard, T.
Greene, J. M.
Horner, G. R. B.
Lockwood, John
Pinckney, Ninian
Wood, W. Maxwell.

FOREIGN.

W. F. Atlee,
A. J. Semmes,
R. R. McIlvaine,
W. H. Berry,
N. J. Pittman,
} Delegates from the *American Medical Society in Paris.*

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