

ANNUAL REPORT

OF THE

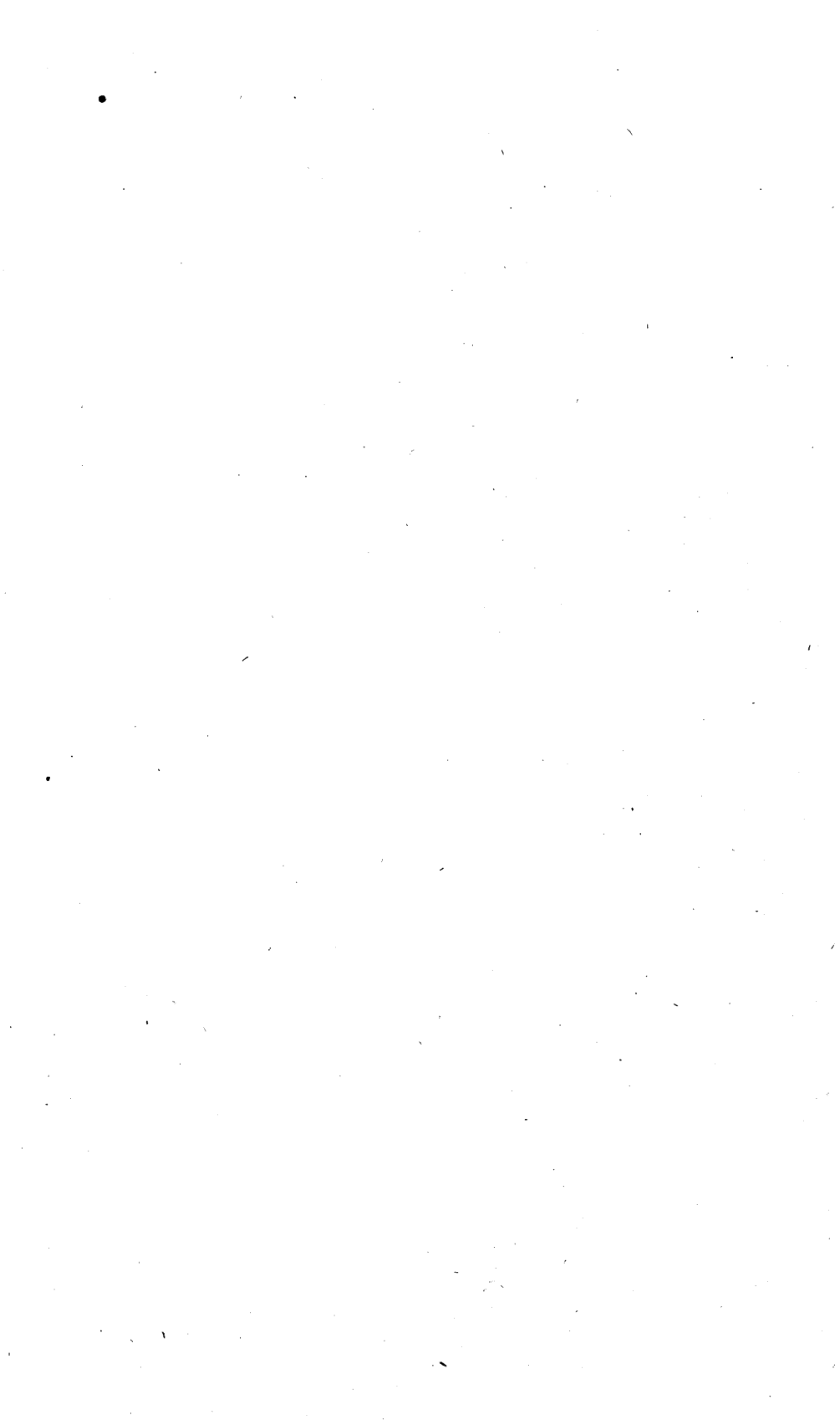
NATIONAL BOARD OF HEALTH

FOR

THE YEAR 1884.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1885.



M E S S A G E
FROM THE
PRESIDENT OF THE UNITED STATES,
TRANSMITTING

The report of the National Board of Health for the year 1884.

FEBRUARY 2, 1885.—Referred to the Committee on Public Health and ordered to be printed.

To the Senate and House of Representatives :

I transmit herewith for the consideration of Congress the report of the National Board of Health for the year 1884.

CHESTER A. ARTHUR.

EXECUTIVE MANSION, *February 2, 1885.*

NATIONAL BOARD OF HEALTH.

OFFICERS.

JAMES L. CABELL, M. D., L. L. D *President.*
STEPHEN SMITH, M. D., &c *Vice-President.*
WILLIAM P. DUNWOODY *Secretary.*

MEMBERS.

Preston H. Bailhache, M. D., U. S. M. H., Marine Hospital, Philadelphia, Pa.
John M. Browne, M. D., &c., Medical Director U. S. Navy, "The Portland," Wash-
ington, D. C.
James L. Cabell, M. D., &c., University of Virginia, Va.
Stanford E. Chaillé, M. D., &c., New Orleans, La.
William P. Dunwoody, esq., 30 Grant Place, Washington, D. C.
Robert W. Mitchell, M. D., &c., Memphis, Tenn.
Thomas Simons, esq., Assistant Attorney-General, Department of Justice, Wash-
ington, D. C.
Charles Smart, M. D., Major and Surgeon, 2017 Hillyer Place, Washington, D. C.
Stephen Smith, M. D., &c., 31 West Forty-second street, New York City, N. Y.
Tullio S. Verdi, M. D., &c., 815 Fourteenth street, Washington, D. C.
George E. Waring, jr., esq., S. E., &c., Newport, R. I.

NATIONAL BOARD OF HEALTH,
Washington, D. C., February 2, 1885.

SIR: I have the honor to transmit herewith the Report of the National Board of Health for the year 1884.

The rendering of this report has been delayed in the hope that the results of the investigation upon yellow fever, referred to in the text, might be included, but as that work is not sufficiently complete the publication is necessarily deferred.

The report summarizes briefly the investigations which have been prosecuted by the Board under the act of March 3, 1879, gives an outline of the movement of the several epidemics of Asiatic cholera which have reached this country, and calls particular attention to the danger to which we are exposed by the prevalence of the disease in Western Europe, and to the urgent necessity for providing means to be used in preventing its introduction and spread in this country. Your attention is earnestly called to the facts set forth in the report and to the recommendations made in connection with this branch of the subject.

In the absence of legislative direction as to the manner of submitting the reports of the Board it is respectfully requested that you will transmit the same to Congress with such recommendations as, in view of the present emergency, you may deem proper.

Very respectfully,

W. P. DUNWOODY,
Secretary.

The PRESIDENT.



ANNUAL REPORT
OF THE
NATIONAL BOARD OF HEALTH, 1884.

NATIONAL BOARD OF HEALTH,
Washington, D. C., January 29, 1885.

SIR: The National Board of Health respectfully submits the following report of its operations during the past year.

By the act of Congress approved July 7, 1883, making provision for the sundry civil expenses of the Government during the fiscal year ending June 30, 1884, the sum of \$10,000 was appropriated for the per diem and personal expenses of the members of the Board.

In consequence of this limitation of the appropriation it became impossible for the Board to avail itself of the services of any but its own members in the prosecution of the investigations authorized by law.

The constant exposure of the southern portion of the United States to the ravages of yellow fever, and the desirability of presenting in a single report the results of experience with the disease in this country, from the earliest times to the present, induced the Board to authorize the preparation of a report upon yellow fever in the Mississippi Valley. Drs. S. M. Bemiss and R. W. Mitchell, members of the Board, both of whom have had great experience in the treatment of the disease, were accordingly assigned to this duty. Information, scattered as it is, through a multitude of volumes, is necessarily inaccessible to the general practitioner, and in undertaking this investigation it was the desire of the Board to place within the reach of all who may be called upon to deal with the disease, in the compass of a single report, an authoritative statement of our present knowledge of yellow fever. To this end the committee, on entering upon their labors, decided upon the following plan in reviewing the literature of the subject:

- (1.) Citations to show that yellow fever is a specific disease, produced by a special poison, whose symptoms are the same everywhere.
- (2.) Citations which show that successive crops of poison are produced.
- (3.) Citations which show whether reproduced in the human body or outside the body.
- (4.) Citations to show period of natural life of poison, say by duration of epidemic when no frost occurs.
 - (a.) Circumstances which favor development of new crops, weather, &c.
 - (b.) Circumstances which favor retention of vitality of the poison.
 - (c.) Circumstances which shorten the life of the poison or are unfavorable to its reproduction.
- (5.) Modes of distribution or dissemination of yellow-fever poison.
 - (a.) Through air (how far). Direct contagiousness.

- (b.)*By persons at time of reaching new foci.
 - (c.) By persons in stage of incubation at time of reaching new foci.
 - (d.) By fomites.
 - (e.) By infected localities.
- Miscellaneous—supposed attacks of inferior animals.

The serious illness of Dr. Bemiss during a portion of last year prevented a rapid prosecution of the work, and the investigation remained unfinished at the time of his death in November last.

Attention has heretofore been called to the valuable services rendered to the country and the world by the several investigations which have been undertaken since the organization of the Board. Some of these were completed, while others which promised equally valuable results in their respective fields of study were necessarily suspended. It is greatly to be regretted that there should be any interruption in the prosecution of investigations into the causes of disease and the best methods of preventing both their development and spread, for upon the dissemination of knowledge upon these subjects depends largely the comfort and well being of the people. The exploration of the field of preventive medicine has long been regarded by those most competent to judge as of equal if not of greater importance than the discovery and application of curative agents.

In this connection it should be remembered that the investigations prosecuted by the Board, as well as most of those of a similar character, are not likely to be entered on to any considerable extent as the result of individual enterprise. Few of those who are engaged in such researches have either the means or facilities for carrying on their work, except in such a limited way as to deprive it of much of the value which would be achieved under other and more favorable circumstances. Recognizing these facts, many of the foreign Governments long since established national sanitary organizations, which are liberally supported and encouraged to prosecute their investigations in all directions that promise, however remotely, to improve the public health.

As a result of the sanitary reforms thus inaugurated, the annual mortality in many portions of the world has been materially lowered, and much added to our knowledge of the etiology of diseases and of the measures necessary to be adopted to prevent the spread of such as are liable to become epidemic.

The necessity for a national sanitary body in this country was long recognized by the leading sanitarians in the several States before any active steps were taken in that direction by Congress, the preliminary steps towards securing such an organization having been taken by the health authorities of New York City more than fifty years ago, or closely following the great epidemic of Asiatic cholera in 1832. As the people recovered from the effects of that affliction, and business was restored to its accustomed channels, the matter was lost sight of, and no effective steps were taken until the close of the last serious epidemic of yellow fever in 1878, when the present Board was established by act of Congress, as follows :

AN ACT to prevent the introduction of infectious or contagious diseases into the United States, and to establish a National Board of Health.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That there shall be established a National Board of Health to consist of seven members, to be appointed by the President, by and with the advice and consent of the Senate, not more than one of whom shall be appointed from any one State, whose compensation, during the time when actually engaged in the performance of their duties under this act, shall be ten dollars per diem each and reasonable expenses, and of one medical officer of the Army, one medical officer of the Navy, one med-

ical officer of the Marine Hospital Service, and one officer from the Department of Justice, to be detailed by the Secretaries of the several Departments and the Attorney-General, respectively, and the officers so detailed shall receive no compensation. Said Board shall meet in Washington within thirty days after the passage of this act and in Washington or elsewhere from time to time upon notice from the president of the Board, who is to be chosen by the members thereof, or upon its own adjournments, and shall frame all rules and regulations authorized or required by this act, and shall make or cause to be made such special examinations and investigations at any place or places within the United States, or at foreign ports, as they may deem best, to aid in the execution of this act and the promotion of its objects.

SEC. 2. The duties of the National Board of Health shall be to obtain information upon all matters affecting the public health, to advise the several Departments of the Government, the executives of the several States, and the Commissioners of the District of Columbia, on all questions submitted by them, or whenever, in the opinion of the Board, such advice may tend to the preservation and improvement of the public health.

SEC. 3. That the Board of Health, with the assistance of the Academy of Science, which is hereby requested and directed to co-operate with them for that purpose, shall report to Congress at its next session a full statement of its transactions, together with a plan for a national public health organization, which plan shall be prepared after consultation with the principal sanitary organizations and the sanitarians of the several States of the United States, special attention being given to the subject of quarantine, both maritime and inland, and especially as to regulations which should be established between State or local systems of quarantine and a national quarantine system.

SEC. 4. The sum of fifty thousand dollars, or so much thereof as may be necessary, is hereby appropriated to pay the salaries and expenses of said Board and to carry out the purposes of this act.

Approved, March 3, 1879.

By reference to the provisions of this act, it will be seen that many very important duties devolved upon the Board.

It is not our purpose to review the operations of the Board under this act at length in this report, but in consequence of the failure on the part of Congress to provide for the publication of the several annual reports containing the results of the investigations undertaken, in numbers at all sufficient to meet the demand, and of the further fact that, except a small edition authorized under the customary resolution to print, the reports for 1880, 1881, and 1882, have not yet been received from the Public Printer, it seems not only proper but essential to a proper understanding of the work which has engaged the attention of the Board, that a synopsis of these investigations should be given at this time.

The following brief summary of investigations undertaken by the Board is, therefore, respectfully submitted.

I. The collection of information and advice from the principal sanitary organizations and sanitarians of the United States as to the best plan for a national public health organization, including the subject of quarantine, both maritime and inland, and the relations which should exist between State or local systems of quarantine and a national quarantine system. This work has been performed by means of circulars, printed memoranda of questions, correspondence, &c., under the direction of the executive committee of the Board, and by conferences with the principal health officers of the country and with the American Public Health Association. After having carefully examined the data thus collected, the Board is of the opinion that the conclusions of the American Public Health Association, as expressed in a series of resolutions which passed at the close of a discussion on this subject at the meeting of that body held at Nashville, Tenn., November 18-21, 1879, may be taken as fairly representing the opinions of the leading sanitarians and most important sanitary organizations of this country. These resolutions are as follows:

Whereas the National Board of Health has, in accordance with the law which created it, requested the advice of the American Public Health Association regarding

the form of a permanent national health organization of the United States, including its relations to quarantine, both maritime and inland; and

Whereas the opinions of the advisory council of the association upon the subject of health legislation, collected and presented to this body through Dr. J. M. Toner, chairman of the council, have been duly considered: Therefore,

Resolved, That, in the opinion of the American Public Health Association, the present National Board of Health has been of such vast service to the country that it is not expedient to make any essential change in its organization, and that any minor improvement in details should be left to the Board itself.

Resolved, That the investigations which have been commenced by the Board are approved and should be continued, and that similar investigations should be undertaken by it into the consideration and prevention of other diseases as well as yellow fever.

Resolved, That Congress should appropriate sufficient funds to enable the Board to employ the best talent and apparatus in such scientific and practical inquiries.

Resolved, That the operation of the existing quarantine law and of the rules and regulations prepared by the National Board of Health on that subject have accomplished great good, and that no change in the law should be made without the most careful and serious consideration.

Resolved, That, in the opinion of this association, the quarantine laws of the United States should be under the direction of the National Board of Health and of an executive committee to be selected by that body.

Resolved, That this association has no suggestions to make with reference to any amendments to existing legislation in regard to quarantine, preferring that they should come from the National Board of Health, as the most competent body to advise whatever may be best.

Resolved, That it is expedient for the National Board of Health to call an international congress for the discussion of the very important subjects of international sanitary quarantine, &c.

Resolved, That it is the duty of the General Government to build, equip, and conduct, at the mouth of the Mississippi River, a quarantine station, at such a place as may be designated by the National Board of Health.

Resolved, That the secretary of this association be instructed to forward to the National Board of Health a certified copy of these resolutions, together with the reports and documents of the advisory council; and that the executive committee be instructed to take such action during the next session of Congress as may seem best suited to promote legislation in accordance with these resolutions.

The Board concurred in the recommendations contained in these resolutions, and after conference with a special committee of the National Academy of Sciences, concurred with that committee in the following report and recommendations:

WASHINGTON, D. C., *December 27, 1879.*

In accordance with section 3 of the act approved March 3, 1879, the committee of the National Academy of Sciences, appointed to confer with the National Board of Health, and having power to act, report that the joint meeting resulted in the following recommendations to Congress:

1st. That for the present no change be made in the plan of organization of the National Board of Health.

2d. That the Board be by law authorized to confer on an executive committee from time to time, and in seasons of emergency, such of its powers and duties as it may deem advisable.

3d. That the Board should continue the special investigations already undertaken by it, as mentioned in its annual report; and that, in addition to these, investigations should be undertaken by it, or under its direction, upon the subjects of cholera, malaria, typhoid and typho-malarial fevers, diphtheria, and cerebro-spinal meningitis.

In addition to these investigations there should also be carried on sanitary surveys of places remarkably unhealthy or liable to become so. The only limitation which should be placed on these investigations and surveys should be the amount of funds appropriated for that purpose. It is believed that, for the present, the sum to be annually allowed for such investigations and sanitary surveys should be \$30,000.

4th. That the National Board should take steps to secure, as far as possible, throughout the country, uniformity in the methods of collecting and reporting vital statistics; and that to this end it should call a convention of representatives of United States, State, and local authorities especially engaged in the collection and reporting of such statistics, with a view to securing agreement upon this subject.

5th. That the act to prevent the introduction of contagious and infectious diseases into the United States, approved June 2, 1879, should be so amended that in order to enforce the penalties provided in that act for vessels which shall enter, or attempt to enter, ports of the United States in violation thereof, it shall not be necessary to show that the port of departure was, at the precise time of departure of such vessel, actually infected with contagious or infectious disease, nor that ten days' official promulgation in the port from which said vessel sailed should have been effected. It seems preferable that all vessels from foreign ports coming to ports of the United States shall be required to have bills of health.

It is also recommended that the medical officer who is to serve in the office of a consul at a foreign port may be either detailed by the President or appointed by the Board at its discretion.

6th. That the National Board of Health, or in the interval of its sessions, in seasons of emergency, the executive committee, shall be charged with the duty of reporting to the President when any given city or locality is considered to be dangerously infected with contagious or infectious disease; and that upon the official publication by the President of such report the transportation of goods or persons from the place thus proclaimed as dangerously infected into other States shall be forbidden under penalties to be imposed under the jurisdiction of United States courts, unless such transportation is carried on in accordance with the rules and regulations approved by the National Board of Health.

These rules shall apply until the President shall publicly declare said place no longer dangerously infected, and in the mean time the National Board of Health shall make to the President weekly reports as to the sanitary condition of such place.

7th. That the President shall be authorized to call an international sanitary conference to meet at Washington, D. C., to which the several powers having jurisdiction of ports likely to be infected with yellow fever shall be invited to send delegates, for the purpose of securing an international system of notification as to the actual sanitary condition of ports and places under the jurisdiction of such powers and of all vessels sailing therefrom.

8th. That the National Board of Health should proceed at once to establish quarantine stations near the mouth of Chesapeake Bay, and in the vicinity of Ship Island in the Gulf of Mexico; that those stations should be provided with all the buildings, wharves, boats, and apparatus for properly treating an infected ship, including passengers, crew, and freight, and that they should be managed by the National Board of Health, and be devoted to the treatment of infected ships entering the mouth of the Chesapeake Bay and bound for any of the ports situated on its waters or the streams emptying therein, and for the ports on the Gulf coast of Florida, Alabama, Mississippi, and Louisiana. It will then only be necessary to maintain a boarding and inspecting station at the several ports. It is recommended that the entire cost of keeping up these stations, by treating vessels at them, should be borne by the United States.

WEIR MITCHELL.
FRANCIS A. WALKER.
J. J. WOODWARD.
WOLCOTT GIBBS.
GEORGE ENGELMANN.
GEORGE F. BARKER.
HENRY DRAPER.
C. F. CHANDLER.
WILLIAM B. ROGERS,

President National Academy of Sciences.

II. The collecting of information with regard to the sanitary condition of some of the principal cities and towns in the United States. Work in this direction was organized at the first session of the Board by the printing, with additions and corrections, of a series of schedules of questions for the sanitary survey of a city; the original schedules for this purpose having been prepared several years previously by a committee of the American Public Health Association. A number of these schedules have been returned to the Board properly filled up, and others are in course of completion. It is believed that the result has already been good in indicating the lines of inquiry which should be pursued by municipal authorities in relation to sanitary matters, and that hereafter a large amount of valuable information might be collected by this means.

III. The appointment of a commission to investigate yellow fever in the island of Cuba; consisting of Dr. S. E. Chaillé and Col. T. S. Hardie, C. E., of New Orleans, Dr. John Guiterás, of Philadelphia, and Surgeon George M. Sternberg, U. S. A.

From their report it appears that yellow fever must be considered as endemic in the island of Cuba, and that for many years it has prevailed annually in the principal ports. The facts presented do not confirm the theory of the spontaneous origin of the yellow-fever poison on board ships, and make it improbable that the cleansing of the harbor of Havana and the constant renewal of its waters, however desirable, would prevent the infection of the shipping at this port. Attention is especially invited to that portion of the report which gives an account of the obstacles placed by the authorities of Cuba in the way of the execution of the law approved June 2, 1879, and to the action taken by the governor-general of Cuba in July, 1866, declaring foul all the ports of the United States, and decreeing that all vessels arriving from them at the ports of Cuba should be subjected to the most rigorous quarantine, in consequence of the report of cholera having appeared in Philadelphia. The recommendation of the report that an attempt should be made to establish an international sanitary code, and the reasons given therefor, also merit careful consideration. In this connection, however, it is to be remarked that, under the existing Constitution of the United States, and the construction placed by judicial authorities as to the scope of the police powers of the several States, it may be impossible that the United States Government should become a party to any international code of quarantine, properly so called, for the reason that it would be impossible to guarantee that, if such code were agreed upon and a vessel coming from a foreign port had complied with all its requirements, such vessels could be admitted into any port of the United States, since it is within the power of any State, and of many municipalities, to impose a quarantine of delay, or even of non-intercourse, upon any vessel arriving at their port or ports. It is for this reason that the Board has attempted to secure at present only an international system of notification as to the sanitary condition of ports and vessels.

IV. The standing committee of the Board on sanitary legislation, consisting of Drs. H. I. Bowditch, S. M. Bemiss, and Stephen Smith, employed a competent legal authority of Boston to collect and collate the sanitary laws of the United States and of the several States, including not only the statutes, but the decisions of the several courts, on all questions involving the public health.

This compilation was of great practical interest and utility to all interested in sanitary legislation.

V. At the request of the Board, an investigation as to the best method of determining the amount and character of organic matter in the air was undertaken by Prof. Ira Remsen, of the Johns Hopkins University of Baltimore.

VI. An investigation as to the effects of disinfectants, and especially of those used for disinfecting inclosed spaces, was undertaken by Dr. W. S. Bigelow, of Boston, assisted by Dr. H. P. Bowditch, professor of physiology, and Dr. Wood, professor of chemistry, of Harvard University, the whole being under the general direction and advice of Dr. C. F. Folsom, secretary State board of health of Massachusetts.

VII. An investigation as to the composition and merits of the various patent disinfectants, was made at the request of the Board, by Prof. C. F. Chandler, of Columbia College, president of the board of health of New York City.

VIII. An investigation as to the prevalence of adulterations in food or drugs in the United States, under the direction of Dr. H. A. Johnson, chairman of the standing committee on this subject. In this connection a paper upon the deteriorations and adulterations of food was prepared for the Board by Dr. R. M. Kedzie, president of the State board of health of Michigan, and a paper on the adulterations of drugs, by Prof. L. Diehl, of Louisville, Ky.

IX. A preliminary inquiry as to the diseases of food-producing animals of the United States and the legislation, whether State or national, which seems desirable in regard to this subject. This was under the direction of a standing committee of the Board, composed of Drs. J. L. Cabell, T. S. Verdi, and P. H. Bailhache, and special reports upon the subject for this committee were prepared by Prof. James Law, of Cornell University, New York, and by T. S. Verdi, member of the Board.

X. An investigation of the flow of sewers in relation to their sizes and gradients was carried on under the direction of Col. George E. Waring, jr., of Newport, R. I., with a view to determining the most efficient and least expensive form of sewers.

It may be observed that the results of this investigation have already been of practical importance, since it was the presentation of a portion of these results to the committee charged with the sanitary survey of Memphis which led that committee to recommend a scheme for the sewerage of that city, based on the researches of Colonel Waring, estimated to cost about \$225,000, in preference to a plan of sewerage prepared in the ordinary manner and estimated to cost \$500,000.

XI. A sanitary survey of the eastern coast of New Jersey bordering on New York Harbor was made with the aid of this Board, under the direction of the State board of health of New Jersey.

XII. A sanitary survey of the city of Memphis, Tenn., was commenced as soon after the close of the epidemic as possible, under the direction of a special committee of the National Board of Health, of which Dr. J. S. Billings was chairman. A preliminary report of this committee was prepared to meet the urgent demand on the part of the municipal authorities for advice as to the course to be pursued.

XIII. An investigation as to the hygiene of the mercantile marine and as to what legislation is expedient to improve its sanitary condition. Surgeon P. H. Bailhache, U. S. M. H. S., was especially detailed by the chief of that bureau to prepare this report.

XIV. An investigation by Dr. Elisha Harris, of New York, upon diphtheria, as it occurred in Northern Vermont.

XV. An investigation by Prof. Raphael Pumpelly, of the United States Geological Survey, upon the influence of various soils upon sanitation, especially with regard to drainage and methods of disposal of excreta.

XVI. An investigation by Drs. H. C. Wood and H. F. Formad, of Philadelphia, as to the effects of inoculating lower animals with diphtheritic exudation.

XVII. Researches by Dr. G. M. Sternberg, U. S. A., upon suspended particles in the air of places liable to infection, which were commenced in Havana and continued in New Orleans. These researches included an investigation upon organized particles from swamps and other malarious localities, with the view of testing the accuracy of the observations of Klebs and Tomassi-Crudeli, and others, on the existence of spores alleged to be the producing cause of malarial fevers.

XVIII. A report by Dr. J. J. Woodward, U. S. A., on the pathological history of yellow fever.

XIX. A report by Professor Abbe, of the Signal Service Bureau, on the possible relations between meteorological phenomena and vital statistics, and especially on the graphical methods of representing such data.

XX. An investigation by Col. G. E. Waring, jr., of Newport, R. I., on the influence on the water-seal of traps of different kinds of currents of water passing through them or through the pipes into which they deliver, under a variety of conditions, covering ventilation, copious or partial, and induced currents arising from the passage of water over the branches of different form and arrangement, including experiments with regard to siphoning and the best manner to secure an adequate flush for water-closets, drains, &c.

XXI. An investigation by Prof. Ira Remsen, of the Johns Hopkins University, Baltimore, as to the amount of carbonic oxide in furnace-heated rooms.

XXII. The history of quarantine in the United States, exhibiting the occasions which give rise to quarantine legislation, or attempts at such legislation, by States or by the General Government, prepared by Dr. Stephen Smith, a member of the Board.

XXIII. A report by Dr. Charles Smart on the water supply of Mobile and New Orleans.

XXIV. A sanitary survey of selected portions of Baltimore City was undertaken by this Board, in compliance with the request of the city council, by Dr. C. W. Chancellor, secretary of the State board of health.

XXV. Experimental investigations, by George M. Sternberg, surgeon U. S. A., relating to the etiology of the malarial fevers.

XXVI. A report upon the sewerage systems of the principal cities of Europe, by Rudolph Hering, sanitary engineer.

XXVII. An investigation on the best method of determining the quantity of organic matter in potable water, and the specific effects of variously contaminated water on the health of persons who have used it, by Prof. J. W. Mallet, of the University of Virginia.

XXVIII. An investigation into the sanitary condition of summer resorts, by E. W. Bowditch, sanitary engineer.

XXIX. An investigation into the conditions of arsenical poisoning by means of emanations from wall papers, carpets and other furniture containing arsenical coloring matter, by Professor Wood, of Harvard University.

XXX. An investigation into the conditions under which different styles of traps lose their water-seal by siphon action, by George E. Waring, jr., S. E., Edward S. Philbrick, C. E., and Ernest W. Bowditch, S. E.

XXXI. An inquiry into the causes and nature of malaria, with special reference to the conditions of its recent prevalence in the States of New York, Connecticut, Rhode Island, and Massachusetts, was commenced, with the approval and co-operation of the several State boards of health, who were to furnish the topographical and clinical data, while the scientific investigation of the essential nature of the malarial poison by experimental processes similar to those of Klebs, Tommasi-Crudeli, and Sternberg was assigned to Dr. J. D. Whitney, of Boston.

This investigation was regarded by this Board as likely to lead to very important results in their bearing upon the public health of an ex-

tensive region recently invaded by malarial fever. It was clearly such an investigation as was within the scope of the duties assigned to the Board by the act of March 3, 1879, and, as relating to a subject in which the entire country is more or less interested, was one for which the service of a National Board of Health was eminently appropriate. It is deeply to be regretted, in the interests of the public health, that it has been necessarily abandoned for want of an appropriation applicable to such purposes.

XXXII. A report of the various forms of legislation by which, in this country, attempts have been made to secure registration of vital statistics, with appended copies of all the various acts passed up to the present time, together with a brief historical sketch of the progress of registration in each State, and the results obtained. There is also appended a table showing the results of an analysis of the various registration laws, so arranged that each can be readily compared with the others in regard to any particular item.

The results of the investigations above referred to have, in those cases in which the work has been completed, been transmitted to Congress with previous reports. Despite the limited circulation which has been given to these reports (only the usual 1,900 copies of each having as yet been printed) it is difficult to exaggerate the interest which has been awakened in the subjects treated, both in our own and in foreign countries. It is with feelings of national pride that we are able to record the commendations pronounced upon these efforts by eminent scientists and sanitarians both at home and abroad. The demand for these reports, both from our own people and from foreign countries, has far exceeded the provision made by Congress, and it is earnestly recommended that additional copies be authorized. It can hardly be expected that provision can be made for supplying all applicants with copies, but it is respectfully submitted the value attached to these reports by the medical profession, by sanitary engineers, and others interested in the advance of sanitary science, warrant the publication of a sufficient number of copies to enable us to supply the public and college libraries of the country, and the Government and other sanitary organizations abroad.

SANITARY LEGISLATION.

The establishment of the National Board of Health and the success which attended its efforts in battling with the epidemic of 1879, awakened the liveliest interest in preventive measures throughout the country. The advantages to be derived from systematic organization and execution of sanitary regulations were practically demonstrated, and the methods of dealing with epidemics, inaugurated by the Board, continue to receive universal support and co-operation. The impulse thus given to the study of all questions relating to general sanitation has resulted in a rapid increase in the number of State and local sanitary organizations. State boards of health or sanitary organizations bearing similar relations to the State governments, are now provided for in twenty-seven States of the Union, while local organizations have been established in many of the important towns, as also in many of the counties throughout several of the States. In some of the States, notably in some of the Eastern and Western States, great improvements have been made, and sanitary organizations perfected which have not only already accomplished great good, but which also give promise of the most satisfactory results in the future. To all efforts made to improve the sani-

tary condition of the country, and prevent the spread of disease, the National Board has given its most earnest and hearty co-operation, and it is to be hoped that ere long there will be not only a State board of health in every State, but also a local board in every county and township throughout the country. It is to the application of preventive measures now known, and of others which will yet be discovered, that we must look, in a very great degree, for an improvement in the physical condition of the people, for a limitation upon the prevalence of disease, for a reduction in the rate of mortality among the people, and a consequent increase in both the available strength and wealth of the nation. Much has already been added to the average length of human life by the application of measures herein referred to; and the rapid development of our country, and the extension of cities and towns in all portions of the land, press home with constantly increasing importance the obligation resting upon those in authority to provide the means for carrying forward all investigations which promise, however remotely, to result in improving and preserving the public health.

In addition to the duty of guarding against the introduction of such diseases as yellow fever, cholera and small-pox from abroad, comes the duty of preventing the spread of these diseases in case they make their appearance in any of our ports. During the years 1881 and 1882, small-pox was introduced into this country from Europe by immigrants seeking homes in this country, and serious epidemics occurred in the Western and Northwestern States. Under rules and regulations adopted by the Board and in co-operation with the State and local boards of health in the threatened and infected localities much was accomplished in the way of eradicating the disease and in providing against its introduction. The incubative period of this disease is of such duration as to enable persons exposed to its infection in European cities just prior to embarkation to reach the interior of this country before the eruptive stage is reached. In consequence, therefore, of the nature of the disease hundreds of persons in its earlier stages passed the Atlantic quarantines and were far upon their way towards their destination in the West before it could be known from what they were suffering. More than one hundred towns in the Western States were thus infected, and great expense and suffering entailed upon the people of those sections.

The health authorities in the States which were visited by these epidemics urge with great force that it is the duty of the Government to protect the people against the epidemics originating with immigrants who have not yet reached their destination—who have not yet become citizens.

The law under which the regulations directed towards the prevention of the introduction of small-pox were made, and providing for the co-operation of the Government with State and local authorities in preventing the introduction and spread of epidemic diseases, expired by limitation in June, 1883. The attention of Congress has heretofore been called to this subject, and the reasons which influenced the Board in advising legislation for the protection of the public health are fully set forth in previous reports. At the last session of Congress the recommendations previously made by the Board were renewed and the following bill was prepared by the executive committee, introduced into Congress, and referred to the Committee on Public Health:

A BILL to amend an act entitled "An act to prevent the introduction of infectious and contagious diseases into the United States, and to establish a National Board of Health."

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That section two of the act entitled "An act to prevent the in-

roduction of infectious and contagious diseases into the United States, and to establish a National Board of Health," be, and the same is hereby, amended by adding thereto the following:

"And the National Board shall co-operate with and, so far as it lawfully may, aid State and municipal boards of health in the execution and enforcement of the rules and regulations of such boards, and of the rules and regulations of the National Board of Health when the same shall have been approved by the President, to prevent the introduction of contagious and infectious diseases into the United States from foreign countries and into one State from another."

SEC. 2. That the Board of Health shall make such rules and regulations as are authorized by the laws of the United States and necessary to be observed by vessels at the port of departure and on the voyage, where such vessels sail from any foreign port or place at which contagious or infectious disease exists to any port or place in the United States, to secure the best sanitary condition of such vessel, her cargo, passengers, and crew; and when said rules and regulations have been approved by the President they shall be published and communicated to and enforced by the consular officers of the United States.

SEC. 3. That it shall be the duty of the National Board of Health to obtain information of the sanitary condition of foreign ports and places from which contagious and infectious diseases are or may be imported into the United States; and to this end the consular officers of the United States at such ports and places as shall be designated by the National Board of Health, shall make to said Board of Health weekly reports of the sanitary condition of the ports and places at which they are respectively stationed, according to such forms as said Board of Health may prescribe; and the Board of Health shall also obtain, through all sources accessible, including State and municipal sanitary authorities throughout the United States, weekly reports of the sanitary condition of ports and places within the United States; and shall prepare, publish, and transmit to State and municipal health officers and authorities weekly abstracts of the consular sanitary reports and other pertinent information received by said Board; and shall also, as far as it may be able, by means of the voluntary co-operation of State and municipal authorities, of public associations, and private persons, procure information relating to the climatic and other conditions affecting the public health; and shall make to the Secretary of the Treasury an annual report of its operations, for transmission to Congress, with such recommendations as it may deem important to the public interests; and said report, if ordered to be printed by Congress, shall be done under the direction of the Board.

SEC. 4. That the National Board of Health shall, from time to time, issue to the consular officers of the United States, and to the medical officers serving at any foreign port, and otherwise make publicly known, the rules and regulations made by it and approved by the President, to be used and complied with by vessels in foreign ports for securing the best sanitary condition of such vessels, their cargoes, passengers, and crews, before their departure for any port in the United States, and in the course of the voyage, and all such other rules and regulations as shall be observed in the inspection of the same on the arrival thereof at any quarantine station at the port of destination, and for the disinfection and isolation of the same, and the treatment of cargo and persons on board, so as to prevent the introduction of cholera, yellow fever, or other contagious or infectious diseases.

SEC. 5. That to pay the necessary expenses of placing vessels in proper sanitary condition, to be incurred under the provisions of this act, the Secretary of the Treasury be, and he hereby is, authorized and required to make the necessary rules and regulations fixing the amount of fees to be paid by vessels for such service, and the manner of collecting the same.

SEC. 6. That the President is authorized, when requested by the National Board of Health, and when the same can be done without prejudice to the public service, to detail officers from the several Departments of the Government for temporary duty, to act under the direction of said Board, to carry out the provisions of this act; and such officers shall receive no additional compensation except for actual and necessary expenses incurred in the performance of such duties.

SEC. 7. That all appropriations for the National Board of Health shall be disbursed under the direction of the Secretary of the Treasury on estimates to be made by the National Board of Health, and to be approved by him. Said National Board of Health shall, as often as quarterly, make a full statement of its operations and expenditures under this act to the Secretary of the Treasury, who shall report the same to Congress.

SEC. 8. That the unexpended balance remaining to the credit of appropriations heretofore made for the National Board of Health on the books of the Treasury Department, amounting to one hundred and twenty-seven thousand and eighty-three dollars and fifty-one cents, be, and the same is hereby, continued and made available for the purpose of carrying out the provisions of the several acts creating the Board and defining its powers. And of the appropriations heretofore made to enable the

National Board of Health to aid State and municipal boards of health and local quarantine stations, to be used in case of epidemic, and now standing to the credit of said appropriation on the books of the Treasury, the sum of one hundred thousand dollars is made available for the same purpose during the fiscal year ending June thirtieth, eighteen hundred and eighty-five.

SEC. 9. That all acts and parts of acts inconsistent with the provisions of this act be, and the same are hereby, repealed.

It will be seen by reference to the provisions of this bill that it proposes the re-enactment of the principal features of the act of June 2, 1879, under which the Board had operated so successfully and with such signal satisfaction to the inhabitants of infected districts and to the great body of medical men throughout the country.

The attention of Congress was also called to the subject by the honorable Secretary of the Treasury, who stated that in consequence of the expiration of the law of June 2, 1879, authorizing the co-operation of the Government with State and local boards of health in preventing the introduction and spread of contagious or infectious diseases, there was no legislation to that end.

Pressing appeals were also sent to the President of the United States, to Congress, and to the Board, urging the importance of sanitary legislation. Fortunately the country has thus far escaped epidemic, and the failure of Congress to provide for the protection of the country by adequate legislation at the last session has not been seriously felt; still there is but one opinion among sanitarians in regard to the matter. All agree that national legislation is necessary; that the improvement and preservation of the public health should receive the immediate consideration of Congress, and, in so far as legislation can form the basis of operations looking to that end, action should be taken during the present session. Commissions are established and liberally supported for eradicating diseases among cattle and hogs and for improving the condition and transportation to market of food-producing animals, while the absence of epidemic among the people has resulted in the postponement of much-needed legislation. It is a well-known fact among sanitarians that sanitary work, to produce its best results, must be inaugurated in advance of the appearance of epidemic diseases; that by such antecedent effort epidemics may be, if not wholly prevented, at least shorn of many of their terrible consequences.

The prevalence of cholera in Southern Europe during the past summer has greatly agitated the public mind, and the gravest apprehensions of impending danger now prevail throughout the country.

In pursuance of the second section of the act of Congress approved March 3, 1879, constituting the Board the adviser of the several Departments of the Government, the executives of the several States, and the Commissioners of the District of Columbia, on all matters affecting the public health, the following communication was addressed to the governors of the several States urging upon them the necessity for preparing at once against the approach of cholera:

NATIONAL BOARD OF HEALTH,
Washington, D. C., November 10, 1884.

SIR: The second section of the act of Congress approved March 3, 1879 (20 Stat. at Large, p. 484, chap. 202), requires that the National Board of Health shall "advise the several Departments of the Government, the executives of the several States, and the Commissioners of the District of Columbia, on all matters submitted by them, or whenever in the opinion of the Board such advice may tend to the preservation and improvement of the public health.

In the execution of this provision of law I am directed to advise your excellency that the presence of Asiatic cholera in epidemic form in Europe is a constant menace

to the people of this country. The disease has pressed steadily westward during the past two years, carrying wide-spread desolation in its path, until now it has found a lodgment in European ports, whence more than one of the epidemics from which we have heretofore suffered have been brought to our shores.

With our vastly increased intercourse with foreign powers and facilities for communication, the disease may at any moment make its appearance in this country. It is profoundly to be hoped that we may escape another visitation of this scourge, but following the history of past epidemics, we can only hope for exemption from its attack, or, should it gain a foothold, for a mitigation of the suffering which necessarily attends its progress, by the most prompt and efficient sanitary service.

No portion of any State should be left unguarded, for our facilities for both local and inter-State communication afford ample means for carrying the poison far and wide throughout the land. In the absence of a sanitary service at any point, that point may, in the event of the appearance of cholera, become the center from which the infection may be spread to other portions of the States.

In view of the imminent danger which threatens our people, and the responsibilities resting upon the rulers and all in high official station, your excellency is respectfully and earnestly requested to call the attention of the legislature to the subject, and to urge the necessity of appropriate legislation for providing the means whereby the most thorough sanitary service, State and local, may be immediately organized.

Much preliminary work requires to be done in many portions of every State to place the country in good sanitary condition, and to this end every organized community should be provided with a competent board of health, and the State with a State board, supplied with every requisite for aiding and directing the local authorities in their sanitary work.

By the prompt adoption of such measures we may hope, if not wholly to escape an invasion of this dread disease, to be able at least to limit its ravages to the places where it first makes its appearance.

I transmit herewith a copy of the rules and regulations framed by this Board and recommended for adoption by State and local boards of health, to be enforced in the event of the prevalence of infectious and contagious disease.

Assuring you of the deep interest taken by this Board in all efforts looking to the preservation and improvement of the public health, as also of its desire to co-operate in such efforts in so far as it lawfully may,

I have the honor to remain, very respectfully,

W. P. DUNWOODY,
Secretary.

His Excellency the GOVERNOR.

Copies of this communication were also sent to State and local boards of health, and the authorities were urged to spare no efforts to secure the most thorough local sanitation.

The following communication, inclosing a copy of the letter to the governors, was also sent to each Senator and Representative in Congress:

NATIONAL BOARD OF HEALTH,
Washington, D. C., November, 1884.

SIR: By direction of the executive committee, I have the honor to inclose herewith, copy of a letter which has been sent to the governors of the several States. A copy has also been sent to the State boards of health and leading sanitary organizations of the country.

The danger to which our people are exposed in consequence of the prevalence of cholera in Europe is of so grave a character that I earnestly invite your attention to the subject of sanitary legislation, and bespeak your active co-operation in impressing upon the members of the State legislature the necessity for at once providing the means whereby the health authorities may act promptly and efficiently in the event of the outbreak of an epidemic.

No effort, State or national, which can by any possibility aid in preventing the introduction and spread of the disease should be omitted, and, to be effective, provision for sanitary work should be made at once.

Very respectfully,

W. P. DUNWOODY,
Secretary.

Copies of the communication addressed to the governors of the several States were also sent to the State boards of health and other sani-

tary organizations throughout the country. It is gratifying to be able to report that this appeal of the board met with a prompt and favorable response, and the executives and sanitary authorities of the several States entered at once upon the work of providing the means and organization for local sanitary work. It is confidently expected that much good will be accomplished by these efforts. The attention of the people is called to the impending danger, and they are becoming instructed in regard to the measures necessary to be adopted, not only to prevent the introduction and spread of cholera, but which are equally efficient in preventing the spread of all other contagious or infectious diseases. Much has been done and is being done in the several States, not only to guard against the introduction and spread of pestilential diseases, but much still remains to be done, and we can only hope for the permanent improvement of the public health through the encouragement and promotion of every effort looking to the discovery or application of measures tending to prevent disease.

ASIATIC CHOLERA IN THE UNITED STATES.

The people of this country have suffered from five epidemics of Asiatic cholera, the first in 1832 and the last in 1873. In order that the danger to which we are now exposed by the recent extensive prevalence of the disease in Europe may be more fully understood, attention is called to the following brief account of the movement of the several epidemics which have reached the United States :

Epidemic of 1832-'35.—Although cholera has been known for many centuries, it was not until a very recent period that this scourge of the East passed beyond the limits of Asia. The epidemic which prevailed in this country in 1832 is perhaps the first one known to have spread westward beyond the Asiatic boundaries. From 1817 to the close of 1821 the disease prevailed in India, and was carried to almost all parts of Asia. During the years 1826 and 1827 another severe outbreak occurred. At this period, in consequence of enlarged facilities for communication, the number of travelers and pilgrims was greatly increased, and the disease was carried along the Persian Gulf route, making its appearance in the capital of Persia, near the Caspian Sea, in 1829, whence during the same year it was carried to Russia. Serious epidemics occurred in many parts of the empire during the next two years, when the disease suddenly began to spread rapidly to the westward, extending its ravages over Northern Europe and to England during the year 1831. The disease appears to have been brought to England in vessels direct from Russia and also in vessels from Hamburg. It spread rapidly to Scotland and Ireland, and in April and May, 1832, was carried to Canada in vessels from Limerick, Dublin, and Cork. From Canada it was carried by immigrants along the lakes, and gaining a foothold at various points, spread through the States of New York, Ohio, Kentucky, Tennessee, and Illinois. The cities of New York and Boston also became centers of infection. From these points the disease spread through New England, the Middle States, Maryland, the District of Columbia, and Virginia, and it was also carried from New York to Charleston, S. C. Cholera also reached New Orleans in vessels from foreign ports, from which city it was carried to Texas and throughout the Mississippi Valley, extending westward from Saint Louis to Forts Gibson and Smith in the Indian Territory.

Epidemic of 1849.—During the prevalence of another epidemic in India, cholera was again carried to the capital of Persia, where it broke out in 1846. Thence it was carried to Russia, and along the caravan route to the principal port of the Black Sea in 1847. In October, 1847, the disease made its appearance in Constantinople, whence it was carried to Austria, thence spreading over Northern Europe and England during 1848. The disease was brought to the United States by German immigrants in December, 1848, the first vessel with cases on board arriving at New York on the 2d, and the next vessel arriving at New Orleans on the 11th of that month. From those two centers the disease spread throughout the country during the next spring and summer.

Epidemic of 1854.—It is believed that this country was at no time entirely free from cholera from the date of the epidemic in 1849 to the close of that of this year, slight epidemics having occurred in several of the States during the years 1852 and 1853. From 1847 to 1859 the disease was continuously present in some portions of Europe, being kept alive by fresh importations from the East. During the year 1853 it prevailed to a very great extent in Russia, spreading over Europe and to England during that year. In France cholera prevailed until the close of 1854, causing more than 125,000 deaths within fourteen months. In January and February, 1854, cholera became epidemic in Saint Louis, the outbreak following closely upon the arrival of immigrants from infected districts in Europe. In April, 1854, it was brought to Chicago in the same way, in May to Detroit, and in June it became epidemic in New York. During the spring of 1854 the disease was brought by immigrants to New Orleans, and in May it was declared epidemic in that city, spreading thence to the States of the Mississippi Valley.

Epidemic of 1866.—The disease made its appearance among pilgrims in the vicinity of Bombay in 1864. In May, 1865, it was discovered among pilgrims from Suez to Alexandria. The first case in Alexandria was reported June 1, and between that date and July 23 60,000 persons died of cholera in Egypt. People fled from Alexandria in all directions, some of the refugees reaching Marseilles and Paris, where the disease broke out among them during the month of June. In November, 1865, cholera was brought to New York by the steamship Atlanta, bringing passengers from Paris. It will be observed the movement of this epidemic was much more rapid than was the case with those which had preceded it. But a single year elapsed between the date of its appearance in India and that of its appearance in this country. But few cases occurred from this importation, and it was not until the following spring, a short time after the arrival at New York of the steamship England with over a thousand German and Irish immigrants, among whom nearly fifty deaths from cholera had occurred during the voyage, that the disease became epidemic. From these immigrants it spread through portions of New York and Brooklyn to the soldiers on Governor's Island, and by the latter the disease was carried to many of the Army posts.

From April to November, 1864, eighteen infected ships arrived at the port of New York, bringing to our shores in the aggregate more than 8,000 immigrants, among whom nearly 1,000 deaths from cholera had occurred during the passage. From these people the disease spread through the country.

Epidemic of 1873.—As has been stated above, a great epidemic of cholera occurred in India in 1865, and spread rapidly westward.

The disease prevailed in Persia from 1865 to 1870; in Russia, during

the years 1869-'70-'71 and '72; in Northern Europe, in 1870-'71 and '72; and in Hungary, in 1871-'72 and '73.

In Hungary, from October, 1871, to December, 1873, more than 400,000 cases were reported.

From Hungary the disease was carried to Italy, thence to Brazil. In 1871 cholera made its appearance in Hamburg, whence it was carried to London, Liverpool, New York, and New Orleans, where it made its appearance in February, 1873.

From the above brief outline of cholera epidemics which have been closely studied in their historical facts by Dr. J. C. Peters, of New York, it will be seen that the prevalence of Asiatic cholera in Europe has been followed uniformly by its appearance in this country. The following statement will serve to impress more fully the facts gathered from the history of Asiatic cholera as to the movement of the epidemics which have reached this country:

Epidemic of 1832.—Prevailed in India in 1826 and 1827; in Russia in 1829; in Northern Europe and England in 1831, and in the United States in 1832.

Epidemic of 1849.—Prevailed in Persia in 1846; in Russia in 1847; in Northern Europe, England, and Ireland in 1848, and in the United States in 1849.

Epidemic of 1854.—Prevailed in Russia, Northern Europe, and England in 1853, and in the United States in 1854.

Epidemic of 1866.—Prevailed in Bombay in 1864; in Europe in 1865, and in the United States in 1866.

Epidemic of 1873.—Prevailed in Persia in 1865-'70; in Russia in 1869-'72; in Austria, Hungary, North Germany, and England from 1871 to 1873, and in the United States in 1873.

It is upon these facts that the conviction is based that Asiatic cholera is likely to make its appearance in this country again at an early day, and it is with a knowledge of these facts that this Board has urged upon the civil and sanitary authorities of the several States the importance of inaugurating at once the most thorough system of local sanitation. The attention of Congress is also respectfully called to the subject in the hope that suitable provision may be made for carrying out the rules and regulations of the Board, and for extending aid to State and local health authorities in the event of the appearance of the disease.

PREVENTIVE MEASURES RECOMMENDED BY THE NATIONAL BOARD OF HEALTH.

Fully impressed with the importance of acting promptly in a matter involving such grave responsibilities, a conference was called by the State and local health authorities to consider the best measures to be adopted for preventing the introduction and spread of cholera. This conference was held at Saint Louis, Mo., in October last; and at the request of the delegates, Dr. Charles Smart, surgeon, U. S. A., and member of this Board, submitted the following statement explaining the rules and regulations recommended by the National Board of Health to be enforced in the event of the prevalence of Asiatic cholera at foreign ports with which we have commercial relations, and also at ports and places within the United States:

The National Board of Health based its rules and regulations to prevent the introduction of cholera into the United States, and its spread from one State to another, upon the following facts, which science and experience have demonstrated, viz:

- (1.) Cholera is caused by a specific germ.
- (2.) This germ must reach the bowels in a living state.
- (3.) The germ maintains its vitality and toxic properties under many conditions, the most important being—
 - (a.) In the immediate discharges from the bowels of the sick;

- (b.) In the soiled clothing of the sick and of the beds they occupy;
 - (c.) In the privies and cesspools which receive the discharges; and
 - (d.) In soil and subsoil waters which become secondarily contaminated.
- (4.) The germ may be destroyed with no other interruption to travel and traffic than is needful to determine the likelihood of its presence and to apply the necessary measures for disinfection.

Guided by these principles the National Board of Health organized the following system of preventive measures, and experience has confirmed its convictions that they comprise the essential sanitary acts necessary to the complete suppression of cholera.

(1.) INTERNATIONAL CO-OPERATION.

The Board early discovered that there would be serious practical difficulties in the administration of rules and regulations recommended by sanitary experience and framed by the legislation of the country to the end of preventing the introduction of foreign pestilence into the United States without the consent, and, as far as possible, the aid and co-operation of other commercial nations. It accordingly took steps to secure this, and a conference was held under the joint authority of both houses of Congress.

The discussion proved that, of the twenty-seven nationalities represented, by far the larger number were prepared to enter into a formal joint treaty that would secure harmony of action in the enforcement of certain important measures for their mutual protection against an invasion by cholera. Too much importance cannot be attached to the co-operation of nations in measures of prevention against the spread of contagious and infectious diseases along the routes of travel and commerce.

(2.) MEASURES TO BE ADOPTED AT FOREIGN PORTS.

The first act of the National Board of Health was to frame rules and regulations to be enforced at foreign ports to secure the best sanitary condition of the vessels about to leave for a port of the United States.

This measure is the true basis of success in efforts to prevent the importation of contagious diseases. Ships are the great carriers and propagators of diseases of foreign origin; crowded with passengers and freight, saturated with putrescent filth, and heated to the requisite temperature for the active growth and multiplication of the germs of disease, the modern emigrant ship is a fertile field for the cultivation of pestilence.

The rules and regulations prescribed by the Board required that each consular officer of the United States in a foreign port, or a medical officer specially detailed by the President for duty at the consulate, should keep himself thoroughly acquainted with the sanitary condition of the port and vicinity, especially with regard to the presence of cholera, yellow fever, or plague, and of the existence of typhus or small-pox in epidemic form. On the request of any master, owner, or agent he was required to make an inspection of any ship or vessel bound for the United States, and to give a certificate or bill of health based on the condition of the port and the result of the inspection. This examination into the sanitary condition of the vessel was required to be made before the cargo was taken on board. The certifying officer was directed to see that the vessel was dry, clean, free from decayed wood, and thoroughly disinfected if last from an infected port, or if the port of departure was itself infected. The shipment of merchandise or articles known to be infected was prohibited, and ballast was required to be approved by the certifying authorities. If the port was infected the passengers underwent medical inspection not more than twenty-four hours before the signing of the bill of health, which was considered valid only if delivered within the twenty-four hours last preceding departure. The bill of health set forth the sanitary history and condition of the vessel; and, if the bill was a clean bill, it was certified that the vessel left the port in free pratique, while if the bill was a foul bill, it was certified that the vessel left the port in quarantine.

A clean bill of health was authorized when the vessel's condition was satisfactory and the port free from infection. A foul bill was given when, on the contrary, the port was infected or the condition of the vessel unsatisfactory. In all cases of doubt as to the infection of the port, a foul bill was directed to be issued; but the existence of infection in the quarantine establishment of the port was not considered cause for a foul bill of health. On the departure of the vessel from an infected port her name, date of sailing, and port of destination were telegraphed to the Board by the certifying officers.

(3.) SANITARY SERVICE AT SEA.

Second only in importance to securing at the foreign port a clean vessel and uninfected freight, with the crew and passengers in healthy condition, is a sanitary service at sea that shall preserve the cleanliness of the ship and the health of the crew and passengers, and arrest or isolate the first case of sickness. Every effort should at this

time be made to induce steamship companies to hold their medical and other officers responsible for cleansing and ventilating their ships during the voyage, and for daily inquiry as to the health of every person on board. Diarrheal affections should be promptly isolated and carefully located, all intestinal discharges being immediately disinfected and thrown into the sea.

(4.) MEASURES RECOMMENDED TO BE ADOPTED ON THE ARRIVAL OF THE VESSEL AT A UNITED STATES PORT.

Although the word quarantine is in common use in connection with these measures the Board in its use did not imply detention for any specified time, but only for such time as was needful to determine the presence or absence of infection in vessels arriving at our ports, and to effect, if present, its destruction or removal.

Every vessel was visited by the quarantine officers, and if cholera or other infectious disease existed at the port of departure, or at any port at which she had touched during the voyage, or on any vessel with which she had come in contact, such of the crew and passengers as were infected were removed to hospital and the others to proper quarters. The clothing and baggage were carefully disinfected. The cargo was discharged and disinfected. After the thorough cleansing and disinfection of the vessel the cargo was reshipped and the vessel permitted to depart.

(5.) SANITARY SUPERVISION OF TRAVEL AND TRANSPORTATION—COASTWISE AND INLAND.

If, notwithstanding these measures to exclude infection, the disease effected an entrance into any of our ports, measures were taken to prevent its spreading from that port to other ports on the coast, or to the interior points. Seacoast, river, and railroad travel and transportation were conducted under sanitary supervision. In the case of coast or river steamboats or vessels sailing from the infected port, measures of inspection and disinfection were enforced similar to those practiced at foreign infected ports; the utmost cleanliness was urged during the voyage, and the importance of frequent inquiry into the condition of the passengers and crew was impressed upon the officers of the vessel. In addition to this, inspection stations were established at certain points on the Mississippi River. The medical officers at these points acted as quarantine officers for the States threatened with invasion. Every vessel was boarded; any change in her sanitary condition since leaving the port of departure was noted on her bill of health, or if needful she was moved to a refuge station for the isolation and treatment of the sick, and for the discharge of cargo and thorough disinfection prior to continuing her voyage. On the arrival of the vessel at the port of destination she was subject to the action of the local authorities, who were recommended to adopt measures similar to those in force in the case of vessels arriving from foreign infected ports.

Railroad trains leaving an infected city, town, or other place, were required to be made up of unupholstered cars, which were fumigated with sulphurous acid for six hours prior to the hour of departure. In view of the results of Koch's recent investigations into the causation of cholera, dry heat might be substituted for disinfection by chemical means in this and similar instances. The baggage, freight, and mail-matter to be transported were thoroughly disinfected, and the passengers inspected by a medical officer before starting. About 5 miles from the infected place passengers and baggage were transferred to other cars which had never been within the limits of the infected district. A second transfer was made at some point about 50 miles distant from the first transfer station. Freight was transferred at some station about 50 miles from the point of departure, and the unloaded cars returned to the infected place.

These measures, having in view the prevention of the importation and spread of the germs of the disease, were published in detail in the first issue of the bulletin of the National Board of Health, June 28, 1879.

There is, however, another and highly important series of measures requiring consideration, in view of the possible introduction of the disease germs at some unguarded point. These consist of—

(1.) Efforts to prevent the occurrence of an epidemic at the infected point by having it, at the time of the invasion, in such sanitary condition that the disease shall not spread on account of the absence of certain unhygienic factors necessary to its epidemic development. It is not needful to specify these measures of general sanitation, nor to point out that, to be efficacious, they must be put in force a long time before the introduction of the disease; for, though surface cleanliness may be speedily effected, the purification of an impure soil is a work of time. But it seems proper to

urge that, as any point may become an infected one, and not those alone which are, from their commercial relations, most liable to invasion, it is important that all points should be rendered, as far as practicable unsuitable for the epidemic development of the disease.

(2.) Efforts to suppress an epidemic at the infected point by perfecting all arrangements to meet it in advance of the occasion, as—

(a.) By providing a corps of officers to conduct a house-to-house visitation in the infected and threatened districts, for the purpose of discovering and treating cases of premonitory diarrhea, of giving instruction on all matters relating to food, drink, the disposal of excreta, &c., and of superintending the disinfection of clothing and premises.

(b.) By arranging for the establishment of camps or quarters in dry and well-drained localities for the accommodation of persons temporarily removed from badly infected houses.

(c.) For arranging for the extemporization of small hospitals in the immediate neighborhood of the infected locality, and for the establishment of an ambulance system in connection therewith for the conveyance and reception of homeless cases, and of those from houses vacated for cleansing and fumigation as being dangerously infected.

The preventive measures recommended by the Board, as explained in the foregoing statement, received the approval of the conference and of the American Public Health Association, which was also in session at Saint Louis, in the following words:

The inspection and quarantine service inaugurated by the National Board of Health and set forth in the paper by Dr. Smart before this conference, but which system is now inoperative for want of an appropriation by Congress, meets with our cordial approval. To enable these protective measures to be carried out, we recommend that Congress be urged in the strongest terms to legislate on this subject at an early date in its coming session, and to appropriate such funds as may be needful. The expenses incident to the work which has to be performed at foreign ports, and the establishment of refuge stations at points on our coast for the detention and treatment of infected vessels arriving from foreign ports, should undoubtedly be borne by the National Government, and not by individual States or municipalities; for the benefits accruing therefrom are general and not restricted to localities, although some ports and cities on the coast may have a more immediate interest in the matter than others in the interior.

APPROPRIATIONS.

The importance of continuing investigations into matters affecting the public health, and of providing means for aiding State and local health authorities in preventing the introduction and spread of pestilential diseases from foreign countries cannot be exaggerated. The results to be attained are of incalculable value in promoting the general welfare of the people.

In the absence of specific appropriations all investigations have been suspended. The following estimates, however, have already been submitted in the manner prescribed by law for continuing this work during the current year, and also for the sums required by the Board in the performance of its several duties during the fiscal year ending June 30, 1886:

Estimates for the current fiscal year.

For salaries and expenses of members.....	\$6,000 00
For salaries of employes.....	2,806 37
For rent, light, fuel, stationery, telegrams, and postage.....	1,400 00
For incidental expenses.....	150 00
For investigations into matters affecting the public health.....	2,500 00
For salaries and expenses of members, 1883.....	700 00
For stereotyping annual report, 1882.....	336 25

13,892 62

Estimates for the fiscal year ending June 30, 1886.

For salaries and expenses of members	\$10,000
For investigations into matters affecting the public health	20,000
For collecting, printing, and distributing information on sanitary subjects ..	5,000
For salaries of employes	5,000
For rent, light, fuel, stationery, blanks, telegrams, and postage	2,500
For incidental expenses	500
Total	43,000

In addition to the above-named sums, it is earnestly recommended that an appropriation be made to be expended in aid of State and local boards of health, in preventing the introduction and spread of contagious or infectious diseases. The danger to which we are exposed by the prevalence of Asiatic cholera in Western Europe has been fully explained in this report. It is a disease which is not limited in its ravages by latitude or longitude, and in the event of its appearance in this country will require the utmost vigilance to prevent its spread.

In this connection the attention of Congress is respectfully called to the fact that there is a large balance of appropriation heretofore made for the National Board of Health remaining unexpended on the books of the Treasury Department, which in consequence of a provision in the act making appropriations for the sundry civil expenses of the Government for the fiscal year ending June 30, 1882, is not now available. It is recommended that this balance be made available for the purpose for which it was originally appropriated, and that in addition thereto a sufficient amount be appropriated to make the sum of \$500,000 available for that purpose.

Respectfully submitted.

JAMES L. CABELL,
President National Board of Health.
 W. P. DUNWOODY,
Secretary National Board of Health.

To the PRESIDENT.